Nova Scotia

ANNUAL REPORT

for the fiscal year
ending March 31, 1985

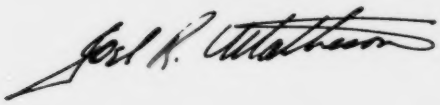
Department of Mines & Energy

PROVINCE OF NOVA SCOTIA
DEPARTMENT OF MINES AND ENERGY

The Honourable Alan R. Abraham, C.D.
Lieutenant Governor of Nova Scotia

Sir:

I have the honour to submit herewith the Annual Report of the Department of Mines and Energy of the Province of Nova Scotia for the period April 1, 1984, to March 31, 1985.



Joel R. Matheson, Q.C.
Minister of Mines and Energy

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DEPARTMENT OF MINES AND ENERGY

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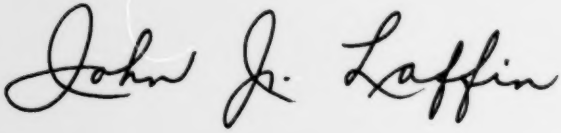

John J. Laffin, P. Eng., F.E.I.C.
Deputy Minister

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DEPUTY MINISTER'S REPORT

John J. Laffin, P. Eng., F.E.I.C.

The Department of Mines and Energy has a broad mandate in minerals, mining, and energy to develop each for the benefit of all Nova Scotians. Under this mandate, the Department was involved in many projects and programs during the 1984-85 fiscal year. The highlights were the signing of the Canada-Nova Scotia Mineral Development Agreement, significant gas discoveries in the offshore, increased production of and value for mineral commodities, and new legislation covering the offshore.

The federal and Nova Scotia governments have launched a five-year development plan, the Canada-Nova Scotia Mineral Development Agreement (CNSMDA), to ensure that Nova Scotia's mineral industry continues to expand and diversify.

The CNSMDA came into effect June 1984. Its main purpose is to promote the development of a wide variety of the Province's on-shore minerals and commodities. These include industrial minerals (anhydrite, barite, celestite, gypsum, limestone, salt, and silica sand); structural materials (aggregate resources, building stone, and fly ash); and metals (antimony, copper, gold, lead, tin, tungsten and zinc). Between now and 1989 $26.9 million, consisting of $16.1 million from Canada and $10.8 million from Nova Scotia, will be invested in parallel, coordinated programs operated by the two governments.

Funds under the Agreement will be used to reinforce private sector mineral exploration. They will improve the Province's mining and processing technologies and will help to identify new uses and markets for mineral products. The public and the mineral industry will be made more aware of the Province's mineral resources and of the positive impact this industry will have on their future. New employment opportunities within the mining sector will be generated from the results of the Agreement.

Rio Algom Ltd. has completed its evaluation of the East Kemptville tin deposit near Yarmouth and has announced the establishment of an open pit mine on the property. Construction work has started and the mine is expected to begin production during the autumn of 1985.

The establishment of a new metal mine in Nova Scotia adds a renewed optimism to the mining sector and supplements the mining of coal, gypsum, salt, aggregates, limestone, and barite. More than 6,500 people were employed

directly and indirectly in mining. The total value exceeded $300 million, up from $290 million last year and represents over 4 per cent of the gross provincial product.

In the coal mining sector, a fire in the Cape Breton Development Corporation (CBDC) No. 26 Colliery shut down production. In order to offset the affects of the closure and to develop more coal resources, CBDC is continuing work on the Lingan-Phalen Mine Development Project at Lingan, near New Waterford, and the Donkin-Morien Development Project at Donkin, near Glace Bay. Both projects are designed to increase the production potential for coal resources in Cape Breton.

Several other production developments highlighted the year. Scotia Limestone Ltd. made the first shipment of limestone from their new Kelly Cove quarry. Construction Aggregates Ltd. of Mulgrave continue to export crushed granite to the United States for architectural use. Nystone Chemicals Ltd. has begun production of drill mud grade barite in addition to its pharmaceutical grade barite. Wallace Quarries Ltd. are investigating the feasibility of reopening the Wallace Sandstone Quarries. With the renovation of Province House and other historic buildings in Halifax, a source of stone is needed. Activities of this company and of the building stone project supported by the CNSMDA may result in the definition of viable quarry sites and production opportunities.

Revenue from royalties and taxes increased in 1984 reflecting the increase in mineral commodities' production. During the year the Department collected $1.78 million in royalties and taxes.

Exploration for mineral resources in Nova Scotia maintained the same level as the previous year. Estimated exploration expenditure for the 1984 calendar year was approximately $7,000,000. The number of exploration licenses has decreased to 1099 from 1300, but the total area held under license remained fairly constant at 1,258,720 acres (509397 ha). Exploration and development projects for gold resources lead all other mineral resources exploration projects in reported value of work. Exploration for tin and tungsten highlighted base metal exploration programs.

Demand for energy remained stable in 1984, despite an increase in economic activity, reflecting continuing improvements in the efficiency of energy use within the Province. Nova Scotia's dependence on crude oil fell to 67 per cent of primary energy consumption during the 1984/85 fiscal year.

In connection with a major review of all existing energy programs, background analysis began for a major update of the 1979 Energy Plan. This analysis and review are essential in light of the significant changes in the energy sector over the last several years and the termination of two major federal-provincial energy conservation agreements, the Canada-Nova Scotia Subsidiary Agreement on Energy Conservation and the Canada-Nova Scotia Agreement on Industrial Energy Conservation.

A major milestone was reached in the development of the Venture Project with a ceremonial signing on March 28, 1985, of gas export sales contracts between the project partners and their United States buyers.

Offshore oil and gas exploration activity again reached record levels, with 15 wells spudded during the year. Four significant gas discoveries were made (Alma F-67, Uniacke G-72, Chebucto K-90, and West Venture C-62) bringing the total number of discoveries to date to 18. The second blowout in Nova Scotia's offshore history occurred in September at West Venture N-91 and proved to be an extremely difficult and expensive problem to overcome.

A call for Proposals for Exploration Agreements was issued in January. It was first under the joint resource management regime established by the 1982 Canada-Nova Scotia Offshore Agreement.

The Canada-Nova Scotia Offshore Agreement on Resource Management and Revenue Sharing was legally implemented as part of a comprehensive package of legislation proclaimed in July 1984. This legislation established a framework for offshore and onshore oil and gas exploration and development in Nova Scotia. Agreements between Canada and Newfoundland (Atlantic Accord), and Canada and the western producing provinces (Western Accord) were analyzed to determine their implications for Nova Scotia.

The Annapolis River Tidal Power Project was officially opened in August, a major step in the development of another significant indigenous, renewable energy resource.

The Department continues to promote interest in energy managment, energy resources, other mineral resources, and geology through displays and presentations at technical meetings and exhibitions, and shopping malls throughout Nova Scotia. The Eighth Annual Open House and Review of Activities was one of these major displays and was held on November 28 and 29. It attracted over 200 people in the mineral exploration and mining industry. This event is open to the public and displays the technical work of the

Department in energy resources and mineral resources projects. More than 20,000 people have viewed the displays in the Open House and the various other displays of the Department.

During the 1984-85 fiscal year, three people died in mining and exploration accidents. I am saddened to report the deaths of Mr. Ronald MacDonald due to the fire in No. 26 Colliery of the Cape Breton Development Corporation and of Mr. Ian MacEachern, under contract with Energy, Mines and Resources Canada, and Mr. Mark Ponsford, of the Nova Scotia Department of Mines and Energy, due to the collapse of an exploration trench.

I am pleased to be working with a professional and highly motivated staff. The high quality of work they have achieved is well documented in this Annual Report. It is a pleasure for me to thank the Minister, the Honourable Joel. R. Matheson, Q.C., for his advice and assistance during the year.

Nova Scotia continues to be a Province well endowed with mineral and human resources. Nova Scotia is a good location for the development of energy and mineral resources related projects because of its varied geology, strong workforce, geographic location, and history of mineral and energy development.

ORGANIZATION AND PERSONNEL OF THE DEPARTMENT

ORGANIZATION

The Department of Mines and Energy is organized into six divisions. Three of these divisions, Mineral Resources, Mineral Development, and Mining Engineering Divisions are grouped together in the Mines and Minerals Branch under an Assistant Deputy Minister (ADM). The Energy Resources and Energy Management Divisions form the Energy Branch also under the direction of an Assistant Deputy Minister. The two ADMs and the Director of the Administration Division report to the Deputy Minister. The organization of the Department, as of 31 March 1985, is shown in Figure 1.

RESPONSIBILITIES

Mineral Resources Division: responsible for the assessment of the Province's mineral potential

- investigates the geology and documents mineral occurrences of the Province through its own scientific programs and through analyses of private sector exploration activities
- provides nontechnical information through maps, brochures, pamphlets, and talks, about the geology and mineral resources, exploration, and mining in Nova Scotia.

Mining Engineering Division: responsible for ensuring that Nova Scotia mines are developed according to current safety, environmental, and mining practices and regulations

- conducts engineering studies
- approves mining plans
- conducts mine inspections and maintains mine rescue stations
- trains personnel in mine rescue and first aid
- administers departmental diamond drilling operations.

Mineral Development Division: responsible for issues involving the exploration and utilization of the Province's mineral resources

- maintains a mineral and petroleum titles registry
- assists development of mineral resources
- operates a technical publications library in Halifax and in Stellarton
- maintains a core library and repository in Stellarton
- monitors all private sector exploration work.

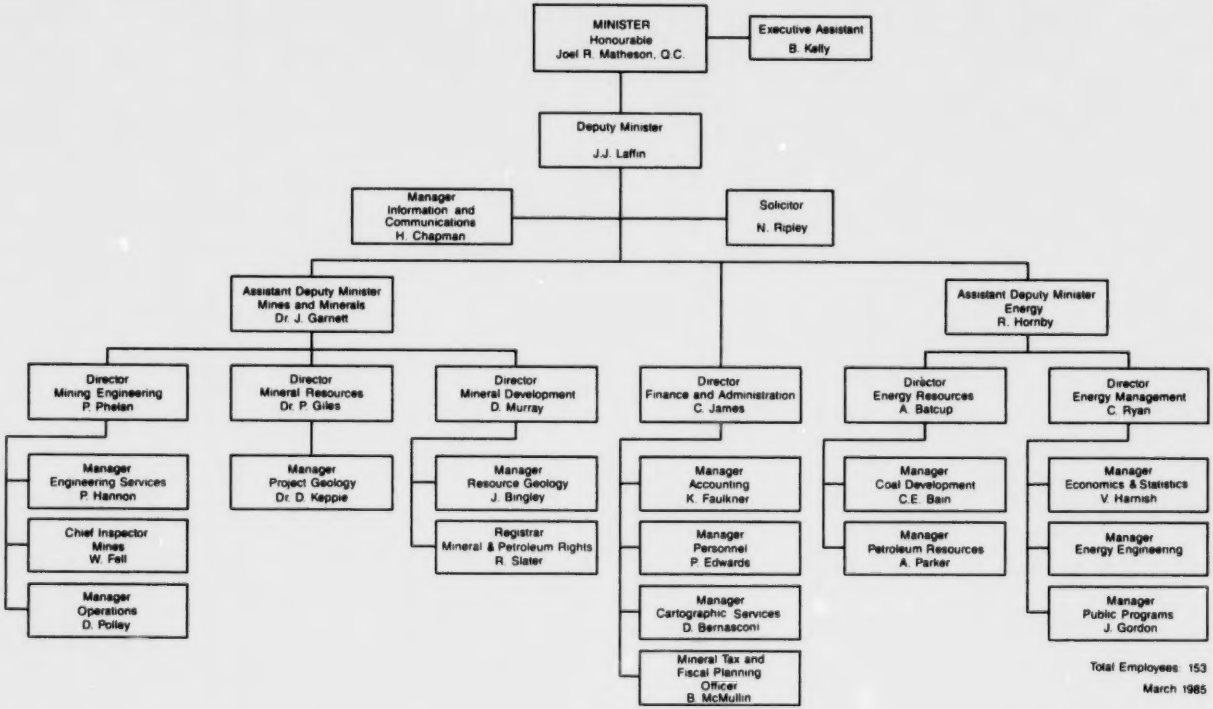


FIGURE 1. Organization of the Department.

Energy Resources Division: responsible for the development of the Province's indigenous energy resources: peat, coal, petroleum, and natural gas

- monitors and regulates all petroleum exploration and development
- undertakes coal and peat exploration programs
- promotes energy resource development.

Energy Management Division: responsible for issues involving the supply of energy from outside the Province and the demand for and utilization of energy within the Province

- develops economic analyses and statistics on energy matters
- provides engineering services related to energy use
- develops and administers energy conservation programs
- provides public information about energy.

Administration Division: responsible for providing financial and other support services to the divisions of the Department

- provides accounting, mineral taxation, legal, and personnel services
- administers coal mine/miner financial aid programs
- provides cartographic and photographic services
- provides accounting services for Novaco Ltd.

CHANGES IN ORGANIZATION

During the 1984-85 fiscal year, the Hon. Joel R. Matheson, Q.C., Minister of Mines appointed Mr. A. Batcup to the position of Director, Energy Resources Division.

PERSONNEL AND OFFICES

The Department has 153 employees, most of whom are employed in Halifax and Stellarton. Local offices are maintained in Glace Bay and Springhill.

Halifax

Joseph Howe Building, 1690 Hollis Street

424-5346 ..... Mines and Minerals Branch
424-5764 ..... Mining Engineering Division
424-4162 ..... Mineral Development Division
424-5351 ..... Energy Branch
424-5933 ..... Energy Resources Division
424-5019 ..... Energy Management Division
424-4629 ..... Administration Division

Brewery Complex, 1496 Lower Water Street
424-4700 .....Mineral Resources Division

Stellarton

32 Bridge Avenue
752-8430 .....Mineral Development Division
(resource geology, exploration monitoring, core library)
Energy Resources Division
(coal exploration)
Engineering Division
(drilling, maintenance work; mine inspection)

Glace Bay

Chernin Building, 10 Commercial Street
849-7500 .....Engineering Division
(first aid, mine inspection)

Springhill

29 Main Street
597-3963 .....Engineering Division
(mine inspection)

MINES AND MINERALS BRANCH

J. A. Garnett, Ph.D., P.Eng., Assistant Deputy Minister

The mineral resources of Nova Scotia and the mines that produce them are an important part of the provincial economy. These mining activities and provide direct employment for over 6,500 people. The development and well-being of the Province's mineral resources sector is an essential part of the work of the Mines and Minerals Branch of the Department.

The Branch has a mandate to promote the understanding of the geology and mineral resources of the Province, the exploration, development and efficient production of mineral deposits, and the maintenance of safe and environmentally acceptable mining practices.

Three divisions report to the Assistant Deputy Minister for Mines and Minerals. The Mineral Resources Division explores, assesses, and publicizes the Province's mineral wealth. The Mining Engineering Division ensures that mines in Nova Scotia are developed according to current safety, environmental, and mining practices and regulations. The Mineral Development Division promotes the exploration and utilization of the Province's mineral resources.

MINERAL RESOURCES DIVISION

P. S. Giles, Ph.D., Director

INTRODUCTION

Geological investigations undertaken by the Division contribute to an improved understanding of the geology, geochemistry and mineral deposits of the Province, and provide direct assistance to the orderly development of Nova Scotia's mineral resources.

ACTIVITIES

The Canada-Nova Scotia Mineral Development Agreement (CNSMDA), signed in June 1984, provides supplementary funding resulting in expanded activity for the Mineral Resources Division. This same Agreement has also initiated expanded complimentary research efforts in Nova Scotia by the Geological Survey of Canada of Energy, Mines and Resources Canada. The combined effect of these coordinated activities will be major advances in knowledge of the mineral resources and mineral potential of Nova Scotia.

Administration of the CNSMDA is divided among four sub-committees which administer each of the four programs. The Division Director is Co-Chairman of the Geoscience Subcommittee and another staff member is Co-Chairman of the Public Information Subcommittee.

Many of the programs and projects developed through the CNSMDA will need additional manpower. At the end of the fiscal year, the Division interviewed and made job offers to thirteen people who will assist in implementing CNSMDA projects.

With the additional people new quarters for the Division were needed. In March 1984 the Division prepared for its move to the Brewery Complex, 1496 Lower Water Street, Suite 312.

Project Geology Section

J. D. Keppie, Ph.D., Manager

INTRODUCTION

Activities of the Project Geology Section can be summarized as information-gathering, through projects and programs, and dissemination of this information through formal publications and professional lectures. In addition, public

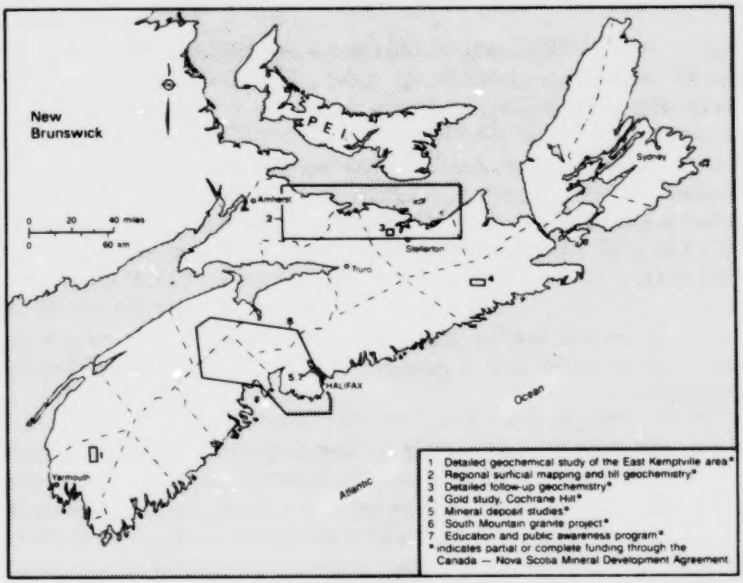


FIGURE 2. Project locations of the Minerals Resources Division.

awareness and appreciation of the Province's mineral resources and mineral industry are developed through non-technical, promotional and educational programs.

With the signing of the Canada-Nova Scotia Mineral Development Agreement (CNSMDA) in June 1984, the Section personnel began the planning of major field projects to investigate the mineral resources of the Province. Several projects under the previous Canada-Nova Scotia Co-operative Mineral Program 1981-84 (CMP) were extended to a completion date in June 1984.

PROJECTS

Although fewer projects were underway during the summer of 1984 compared to the previous summer, the projects were located across the Province and ranged considerably in scope and character (Fig. 2). These activities collectively provided geological and mineral resource data that is widely used by exploration companies, government and private land use planning groups, environmental groups and various federal and provincial agencies.

Geochemical Surveys

The geochemical sampling projects assist the mineral exploration industry in defining exploration targets and in delineating areas of anomalous metal concentrations in different parts of the Province.

Following the completion of the regional geochemical survey during the summer of 1983, selected areas were resampled during the 1984 summer to ensure analytical accuracy and to followup on anomalous values of metals in particular areas. This project began under the CMP and is continuing under the CNSMDA.

All of the data from the sampling program of summer 1983 and previous years will be combined in a geochemical atlas. This project is part of the CNSMDA.

A special geochemical study of lake sediments was completed around the East Kemptville tin deposit in Yarmouth County. Each sample of lake sediment was analyzed for tin, rubidium, fluorine, chlorine, and uranium. The results indicate that, for each element, a "halo" of anomalous values surround the tin deposit. Site-specific studies such as this lead to a better understanding of the use of geochemical sampling in mineral exploration.

Surficial Mapping and Till Geochemistry

Much of Nova Scotia is covered by surficial glacial deposits which blanket the underlying bedrock and hinder mineral exploration. However, detailed study of these surficial materials and their geochemistry should reveal the mineral potential of the bedrock in drift-covered areas.

During the 1984 field season, the glacial deposits and till geochemistry were studied in a broad area of northern Cumberland, Colchester and Pictou Counties. Ninety-seven surface till samples were collected from this region and the clay-sized fractions of these samples were analyzed for 14 elements. Part of each sample was analyzed for tin and tungsten.

Follow-up geochemical sampling of lead-zinc anomalies began in northwestern Pictou County. This project was designed to assess specific metal anomalies and sampling techniques.

Gold Studies

Detailed geological investigations supported by the CNSMDA continued at Cochrane Hill north of Sherbrooke in Guysborough County. This project involves the examination of the open pit at the Cochrane Hill property of Northumberland Mines Limited. During the summer, sampling of the quartz veins and rocks in the open pit was completed.

The work on this project began under the CMP as part of a regional and multidisciplinary geological mapping program of the mineral potential of the gold-bearing Meguma Group and associated intrusive and metamorphic rocks in Halifax and Guysborough Counties.

Mineral Deposit Studies

The search for new mineral deposits requires a thorough understanding of known deposits and the factors controlling their origin and localization. This is a project that combines all the data from other field projects and develops models for the formation and location of mineral deposits. Under the CNSMDA, the mineral deposits study will result in the production of a map and report which will combine the details of the ancient environments of rocks with mineral deposit locations. Work such as this provides a long-term stimulus to mineral exploration.

South Mountain Granite

The East Kemptville tin deposit is only one of many mineral deposits and occurrences in the arcuate-shaped South Mountain Granite stretching from Halifax to Yarmouth in southwestern Nova Scotia. The granite and related rocks contain occurrences of tin, tungsten, copper, zinc, silver, molybdenum, uranium, manganese, and gold. Preliminary studies of the granite and plans for the field work to be undertaken in the next several years were begun by the geologists of the Division.

EDUCATION AND PUBLIC AWARENESS

The purpose of the Education and Public Awareness Program is to produce and promote educational information about the geology, mineral resources and mining history of the Province, and about the geological projects of the Mines and Minerals Branch. The Prospecting Course, displays, the Annual Open House, and publications are ways of meeting this goal.

Prospecting Course

During the fiscal year 1984-85 the course, Prospecting and Geology in Nova Scotia, was offered twice. During the autumn the course was offered in Truro. The spring course marked the fifth time the course has been offered in Halifax. To date, over 100 people have taken the course.

The course covers identification of rocks and minerals, use of maps and airphotos, preparation of geological maps, prospecting techniques and the role of the Department in mineral exploration. The Chamber of Mineral Resources of Nova Scotia, the Department of Mines and Energy, the Colchester-East Hants School Board, and Dalhousie University sponsor the course.

Displays

The Education and Public Awareness Program is responsible for displays pertaining to mineral resources and mining in the Province, and to the projects of the Mines and Minerals Branch. Displays at technical meetings and various exhibitions across Nova Scotia presented information about previous gold mining, mineral exploration and development, the Department, and the geology of the Province. Major exhibits were prepared for the Nova Scotia Forestry Exhibitionat Windsor, Caledonia (Queens County) Gold Rush Days, Rockhound Roundup at Parrsboro, Cumberland County, and the Prospectors and Developers Association (PDA) meeting in Toronto. Well over 12,000 people have viewed these displays.

At the PDA two displays were established. One introduced the Department and the mineral exploration and potential of the Province. The second display focused on the mineral potential for tin, tungsten, gold, and silver in the South Mountain Granite region of Nova Scotia.

Open House

Each year the Mines and Minerals Branch hosts the Open House and Review of Activities. The event was held on November 28 and 29, 1984. In excess of 200 people attended the function to hear talks and to see displays by geologists from the Department, the Geological Survey of Canada, and Nova Scotia universities.

PUBLICATIONS

Detailed technical publications are the principal means of communicating information about the geology and mineral resources of Nova Scotia. Thetechnical reports are published either as part of the Department's publications series or in scientific journals. In addition, divisional staff give lectures and talks at scientific meetings, local universities, schools, and community groups.

Technical reports for each of the projects appear in the annual Mines and Minerals Branch Report of Activities. Brief descriptions of each project appear in the Annual Open House and Review of Activities publication. A list of publications by the geologists of the Section, as well as other Departmental publications, appears in Appendix A.

MINING ENGINEERING DIVISION

P. W. Phelan, P.Eng., Director

INTRODUCTION

The Mining Engineering Division is responsible for the administration and regulation of the mining industry in the Province on behalf of the Department of Mines and Energy. These functions include the approval of new mining projects or modifications to existing projects, the responsibility for occupational health and safety of workers, protection of the environment, and efficient use of the Province's resources. The Division provides a diamond drilling service to the Mineral Resources and Energy Resources Divisions of the Department. The Division is responsible for maintaining the equipment and facilities needed for drilling activities and maintenance services for departmental vehicles.

SIGNIFICANT EVENTS IN 1984-85

Rio Algom Ltd. completed an evaluation of the East Kemptville tin deposit near Yarmouth, which was acquired from Shell Canada Resources Ltd., and have decided to establish an open pit mine on the property. Construction work has started and the mine is expected to be in production in the Fall of 1985.

A small, limited tonnage, barite mine has been established at Bass River, Colchester County, by the Atlantic Barite Co. The expected life of the mine is less than one year and all of the product is being sold to Magcobar.

The No. 26 Colliery in Glace Bay was sealed following a fire on April 5, 1984. Unfortunately one man, a fan operator, lost his life.

The Drummond Coal Mine in Westville was sealed following a fire on August 23, 1984. There were no injuries associated with this fire. Pioneer Coal Company has purchased the assets of the Drummond Coal Company and are planning to establish a small surface mine to recover the crown pillars and to build a wash plant to process the coal dumps located on the property.

An open pit barite mine is being established at Scotsville, Inverness County. Some ore has been mined and production will start as soon as the small milling plant is completed.

Evans Coal Mine Ltd., Chimney Corner, Inverness County, received a Federal Government Grant of $1,500,000 to install new equipment and improve safety and productivity of the mine.

It is with regret we report that there was one fatal accident associated with the mines and quarries of the Province in 1984. Ronald MacDonald was fatally injured in the CBDC No. 26 Colliery on April 5, 1984.

MINING EXAMINATIONS

Board of Examiners

Under the Coal Mines Regulation Act, positions in underground operations must be filled by individuals who have an appropriate "Certificate of Competency". A Board of Examiners is responsible for overseeing the examinations and issuing the certificates.

The Board consists of five members appointed by the Minister of Mines and Energy:

A. MacKenzie, P.Eng., Glace Bay
H. Slaunwhite, P.Eng., Sydney
J. Reid, P.Eng., Sydney
K. MacLeod, P.Eng., Sydney
W. Fell, P. Eng., Halifax

The Secretary to the Board is P. Phelan, P. Eng., Halifax.

Certificates of Competency

Training and examinations for seven categories were held at the University College of Cape Breton. The categories are: Mine Supervisor; Mine Examiner; First and Second Class Mine Electrician; First and Second Class Mine Mechanic; and Hoist Operator. Examinations were also held for the certificate of competency as Mine Manager and Underground Mine Manager.

Each year the Mining Society of Nova Scotia awards a prize for the highest grade in examinations for Mine Manager, Underground Mine Manager, and Mine Supervisor. In 1984 the awards were made in three categories:

Manager — Leslie Hicks
Underground Manager — Alan C. Harvey
Mine Supervisor — Robert W. MacDougall

The results of the examinations are shown in Tables 1 and 2. All examination candidates were successful.

TABLE 1. Examination Results for Certification Under the Coal Mines Regulation Act

Category	Number of Candidates
Manager	8
Underground Manager	6
Supervisor	4
Mine Examiner	6
Hoist Operator	4
Mine Electrician, 1st Class	15
Mine Electrician, 2nd Class	8
Mine Mechanic, 1st Class	37
Mine Mechanic, 2nd Class	12
Console Operator	8
TOTAL	108

TABLE 2. Summary of Other Certificates Issued by the Board of Examiners

First Class Coal Miner	20

Mining Engineering Section

P. J. Hannon, P.Eng., Manager

The Mining Engineering Section is responsible for ensuring that the mineral and energy resources of the Province are utilized to their optimum, and that mining operations are conducted in a safe, efficient, and environmentally acceptable manner. This includes reviewing proposals from industry for new mining projects or modifications to existing mines, and making recommendations for the issuing of mining leases and permits. The Section also provides technical advice and assistance to industry and government on complex mining problems, and conducts economic and feasibility studies for new mineral projects.

Mine Inspection Section

W. J. Fell, P. Eng., Chief Inspector

The Inspection Section is responsible for inspecting mines and quarries to ensure the health and safety of employees in the mineral industry. Routine mine inspections are conducted under authority of the Coal Mines Regulation Act and the Metalliferous Mines and Quarries Regulation Act in all mines and quarries within the Province, except for the coal mines of the Cape Breton Development Corporation (CBDC) which are inspected by the Department of Labour Canada. The mine rescue stations of CBDC are inspected by the Department and the Board of Examiners certifies workers for CBDC. The Inspection Section has a staff of eight working from regional offices in Stellarton, Glace Bay, and Springhill. The number and types of inspections conducted during the fiscal year areshown in Table 3.

TABLE 3. Inspection Statistics for the 1984-85 Fiscal Year

Total Inspections	398
Mine Rescue Classes Conducted	36
Mine Rescue Station Inspections	44
Fatalities	1
Unusual Occurrences	3

Mine Rescue

The Mine Rescue Program is designed so that sufficient fully-trained mine rescue teams are available for an emergency at any mine in the Province. Mine rescue stations are located at most mines. A central mine rescue station operated by the Department is located at Stellarton. Two inspector/instructors are employed by the Department. Monthly training sessions are conducted at all underground mines in the Province. Mine rescue instructors also conducted classes in mine rescue procedure at the University College of Cape Breton in Sydney and at the Technical University of Nova Scotia in Halifax.

The annual Provincial Mine Rescue Competition was held in the Miners Forum, Glace Bay on Saturday, June 16th, 1984. Five mine rescue teams from the Cape Breton Development Corporation and one each from the Canadian Salt Company Ltd., Drummond Coal Company and Evans Coal Mine Ltd. took part in the event. A team from the Lingan Mine (CBDC) won the competition.

First Aid

First Aid instruction is given at all mine sites. Inspections are made of the first aid facilities and programs at these mines. Sixty-six candidates were successfully certified in the St. John Ambulance emergency first aid course administered by the Department.

Drill and Mechanical Section

D. Polley, Manager

The Drill and Mechanical Section is responsible for operating the Department's diamond drills and maintaining all mechanical equipment and vehicles.

The amount of drilling performed by the Section declined by 12 per cent in 1984. The drilling was conducted on 10 projects for the Mineral Resources, Mineral Development, Energy Resources, and Mining Engineering Divisions.

TABLE 4. Annual Drilling Statistics

Year	Number of Holes	Amount Drilled	
		Feet	Metres
1982-83	84	22,189	6763
1983-84	76	19,862	6054
1984-85	27	17,430	5314

MINERAL DEVELOPMENT DIVISION

D. A. Murray, M.Sc., Director

The Mineral Development Division is divided into two sections, the Resource Geology Section and the Mineral and Petroleum Titles Section. The responsibilities of the Division lie in the orderly development and promotion of the Province's mineral resources. Included in these responsibilities are mineral resource regulations, mineral titles policies, and assistance in the promotion and development of all minerals. It also maintains geological information through the departmental libraries and drill core library. The Division monitors mineral production and mineral exploration activity in the Province and provides liaison between mineral producers, the exploration research establishments, landowners, and government agencies. Collection and compilation of mineral production and exploration statistics is another important function of the Division.

Development of a revised Mineral Resources Act continued throughout 1984. Discussions were held with the Chamber of Mineral Resources of Nova Scotia regarding proposed changes in the Mineral Resources Act.

During 1984, several terminated Development Licenses were opened for tender. Exploration proposals were received for the former operating mine at Stirling in Cape Breton and the Fifteen Mile Stream Gold District in Halifax County. Development proposals were received for the former Kaiser celestite deposit (MacRae Pit) at Lake Enon in Cape Breton.

The new Canada-Nova Scotia Mineral Development Agreement (CNSMDA) has allowed for expansion of the programs carried out by the Mineral Development Division. Expanded projects have started in industrial minerals, land use research, market studies, and commodity inventories. These projects will provide new and updated information which should encourage additional mineral opportunities in Nova Scotia.

Mineral and Petroleum Rights Registry

R. Slater, P. Eng.
Registrar of Mineral and Petroleum Rights

The Mineral and Petroleum Rights Registry is responsible for receiving applications for mineral and petroleum rights and, subject to verification for accuracy and availablity of lands, for issuing and registering the licenses or leases. In addition, any documents affecting licenses, such as transfers of title, assignments of interest, option agreements, special licenses, and exploration

agreements are registered by this office. The Registry also receives all statements of exploration expenditures and assessment reports that pertain to the renewal of licenses and leases. In addition to matters directly affecting licensing, maps showing the disposition of lands under license or lease are maintained and continually up-dated. Applications for underground gas storage rights and treasure trove licenses are processed through this office. Information concerning production and employment in Nova Scotia's mines and quarries is also received by the Registry.

A large number of enquiries from industry, the public, and other government departments are answered each year. Most enquiries deal with procedures for obtaining licenses, information on past exploration and mining activities, statistical information on production for operating properties, and general questions about licenses. A notable service to the public and industry is the printing and supplying of the land disposition map sheets (scale 1:31 680) which are obtainable for a nominal charge. The Registry is responsible for all fees, bonds, and other monies due for licenses, leases, statutory work deposits, payments in lieu of work, and sale of maps and other items such as acts and publications.

The Registry maintained a fairly high level of activity in 1984 (Table 5). In total, 1,039 exploration and development licenses were issued to 202 licensees for a total of 31,468 claims or 1,258,720 acres (509 397 ha). One hundred seven transfers were processed and 23 agreements were received. During 1984, exploration and development work totalling $2,625,666 work was reported to have been conducted in the Province (Table 5). In support of this reported work, 127 assessment reports were received in 1984. Registry staff participated in the review of the *Mineral Resources Act* and in the formation of Regulations under the *Petroleum Resources Act* which was proclaimed in 1984. In addition to maintaining the claims reference maps and the compilation map showing land disposition for the Province, a new map series was prepared to display exploration expenditures from 1978 to 1983.

During 1984, the Registry began to computerize its operations. A study was undertaken by the Department of Government Services and the resulting report serves as a base for the automation of the mineral rights system.

TABLE 5. Mineral exploration trends in Nova Scotia.

		1977	1978	1979	1980	1981	1982	1983	1984
SUMMARY (onshore)									
Value of Reported Assessment Work		$ 3,800,000	$ 5,900,000	$ 4,700,000	$ 7,564,000	$ 8,441,270	$ 4,100,000	$ 4,200,000	$2,625,666
Exploration Expenditure		—	—	—	—	$14,608,000	$ 5,553,000	$ 7,000,000	$ 7,000,000[1]
Total Licences Issued		2,894	2,393	1,841	2,559	1,952	1,298	1,350	1,039
CLAIMS RECORDED ONSHORE[2]									
Base Metal	claims	70,936	38,597	40,497	88,703	68,863	39,626	40,630	26,627
	acres	2,837,440	1,543,880	1,619,880	3,548,120	2,754,520	1,585,040	1,585,040	1,065,080
	hectares	1 148 296	624 799	655 556	1 435 904	1 114 739	648 871	657 709	431 032
Uranium	claims	48,721	31,978	30,920	25,483	6,225	—[3]	—[3]	—[3]
	acres	1,948,840	1,279,120	1,236,800	1,019,320	249,000	—	—	—
	hectares	788 685	517 653	500 526	412 513	100 769	—	—	—
Salt, Potash	claims	887	1,148	2,256	13,505	5,225	1,065	505	1,257
	acres	35,480	45,920	90,240	540,200	209,000	42,600	20,200	50,280
	hectares	14 359	18 584	36 519	218 616	84 581	17 240	8 175	20 348
Coal	claims	—	—	—	—	4,880	3,072	4,565	3,584
	acres	—	—	—	—	195,199	122,880	182,599	143,360
	hectares	—	—	—	—	78 996	49 729	73 897	58 017
Number of Mineral Assessment Reports		90	132	126	140	150	124	188	127

TABLE 5. Continued

		1977	1978	1979	1980	1981	1982	1983	1984
Total Areas Held	acres	4,821,760	2,868,920	2,946,920	5,107,640	3,212,520	1,627,640	1,827,999	1,258,720
Under Licence	hectares	1 951 340	1 161 036	1 192 601	2 067 033	1 379 085	709 219	739 781	509 397
PETROLEUM LICENCES ISSUED									
Land Areas	licences	20	37	44	52	99	68	93	106[4]
	acres	2,431,592	3,452,573	3,456,875	4,284,909	6,230,046	5,419,952	8,048,306	8,567,791[4]
	hectares	984 052	1 397 237	1 398 978	1 734 079	2 521 265	2 193 424	3 257 104	3 467 338
Submarine Areas	licences	160	160	147	151	172	168	—	—
	acres	33,634,964	33,634,964	31,221,055	31,589,070	34,786,199	33,965,867	—	—
	hectares	13 611 883	13 611 883	12 634 978	12 783 921	14 077 781	13 745 798	—	—

[1]estimate from Nova Scotia Department of Mines and Energy sources.
[2]claims are 40 acres or 16.2 ha each
[3]uranium exploration and mining moratorium in effect
[4]as of July 1, 1984

Resource Geology Section

J. M. Bingley, B.Sc., Manager

INTRODUCTION

The Resource Geology Section performs eight distinct functions that are all related to provision of geological services or geological information both to the mineral industry, government agencies, educational establishments and the public.

Activities at the two offices are described in the following pages under the headings listed below. Additional sections summarizing work by industry is included under the heading Private Sector Exploration and Development and the heading Industrial Minerals Development and Production Overview. The location of projects managed by the Section is shown on Figure 3.

Halifax Office
Industrial Minerals
Land Use Policy Development
Library Services
Metallic Minerals
Mineral Inventory

Stellarton Office
Drill Core Library
Exploration Monitoring
Technical Support Services

HALIFAX OFFICE ACTIVITIES

Industrial Minerals

Industrial mineral activities in 1984 maintained the momentum begun several years earlier. This can be attributed to several factors: 1) expansion and diversification of industrial mineral commodity markets on a worldwide scale, 2) technological developments in the manufacturing industry requiring additional and new industrial mineral raw materials, 3) the purchasing power of the U.S. dollar, and 4) changes in attitudes and tastes in architectural design and building material usage. These factors, coupled with an awareness nationally and internationally that Nova Scotia has many industrial mineral commodities translated into sustained interest and growth of the Province's industrial mineral resources.

In response to these developments and as part of the recently signed five-year Canada-Nova Scotia Mineral Development Agreement (CNSMDA), the Mineral Development Division, working in concert with Mineral Policy Sector and the Canada Centre for Mineral and Energy Technology (CANMET), designed several industrial mineral programs to be undertaken over the next five

years. These programs will stimulate expansion and diversification of the existing industrial mineral industry and identify new mineral development opportunities in the Province. Included are commodity market studies, mineral technology programs and resource evaluation and documentation projects.

Four projects were underway in fiscal year 1984-85. They were a gypsum wallboard plant in Nova Scotia feasibility study by The Centre for Resource Studies, Queens University; a strontium market study by the Metal Economics Group of Boulder, Colorado and Halifax, Nova Scotia; and two projects by the Mineral Development Division, the continuation of an aggregate resource evaluation program of Southwestern Nova Scotia and a study to document gypsum property and gypsum lease ownership in Nova Scotia.

Also in 1984 a first draft of a report on the Cretaceous Deposits of Nova Scotia was completed. This report documents the refractory clays and silica sand deposits found in central mainland Nova Scotia and on Cape Breton Island. A new edition of the Industrial Minerals Commodity Map for Nova Scotia was being prepared and will be published in 1986.

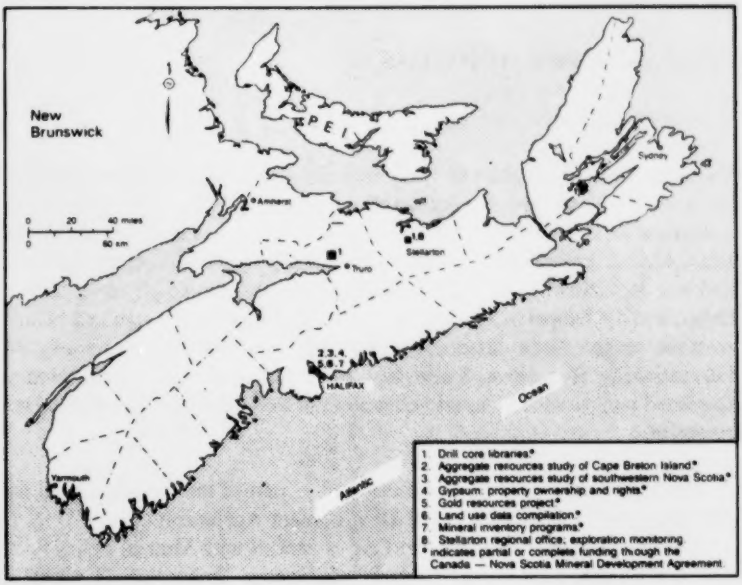


FIGURE 3. Project locations of the Mineral Development Division.

Throughout the year the industrial minerals geologist maintained close liaison with industries' production and exploration activities. Technical information assistance was provided on request from a portfolio of information developed for most industrial mineral commodities known to exist in the Province. Industry follow-up work included programs on several commodities such as aggregates, barite, building stone, celestite, diatomaceous earth, limestone, slag, silica, and talc.

Also in fiscal year 1984-85 tenders were called on three industrial mineral properties on Cape Breton Island. In September, 1984 the Department invited development proposals on the MacRae celestite deposit at Enon, Cape Breton County and in March, 1985 exploration proposals were requested on the former Novex barite property at Pine Brook, Richmond County and the Diogenes Brook silica sand deposit at Melford, Inverness County.

Mineral Land Use Policy Development Project

A land use project was initiated during 1984 to develop a mineral land use policy for Nova Scotia. Financial support for the project was provided by the Canada-Nova Scotia Mineral Development Agreement. This is a project consisting of three phases:

1) information gathering and production of a Mineral and Energy Resources Handbook series for the rural municipalities of Nova Scotia;
2) mineral potential maps for Nova Scotia;
3) a Mineral Land Use Policy for Nova Scotia.

The following summary describes major tasks conducted during the first phase.

Protected and limited Use Lands Map. A 1:500 000 scale map showing land restricting mineral exploration and development within the Province is being compiled. Examples of such land areas are watershed areas, national parks, provincial parks, and urban areas.

Watersheds and Mineral Exploration. A background paper is in preparation describing water supply watershed lands and how their jurisdictional regulations affect, or potentially affect, mineral exploration and development.

Mineral Land Use Information Base. A manual file has been created to organize all pertinent information regarding exploration and development of mineral, energy, and construction material resources relevant to each of Nova

Scotia's 24 rural municipal jurisdictions. For example, items might include: drillhole locations, mineral commodity locations, abandoned shaft locations, known areas of subsidence, mines, quarries and pits.

Mineral and Energy Resources Handbook Series. Data collected in the mineral land use information base as well as on sets of mineral resource and land use maps are essential elements of the Handbook series. The Handbook is a method for displaying information compiled for each of the 24 rural municipalities in the Province. Providing provincial and municipal planners with these information packages should assist in better land use decision making.

Mineral Resource/Land Use Maps. All relevant Mineral and Energy land use information will be plotted using the 1:50000 scale planimetric map series. Each municipal district will be covered by a set of mineral resource/land use maps.

Provincial Resource Atlas. A new Provincial Resource Atlas project was initiated by the Department of Development. The Department of Mines and Energy submitted six maps and accompanying text.

Library Services

The Department maintains two technical libraries. A main library is located in the Halifax office with a branch library in the Stellarton office. Over 7,000 maps, 2,500 exploration assessment reports, 500 open file reports, 450 theses, 200 different periodicals, journals, and trade magazines, and numerous reference texts and other document types are held in the libraries. The libraries function as important resource centres for information on the geology, energy resources, and mining history of Nova Scotia. To this end, the libraries provide the following services and facilities:

- reference and information service to the general public, provincial government personnel, professional geoscientists, engineers, and consultants in private industry
- sale of Department and Geological Survey of Canada publications and maps
- catalogued and classified files of the library holdings, including exploration assessment reports, open file reports, open file maps and theses
- a mailing list of individuals, institutions, and corporations that wish to be informed of our activities and publication releases
- facilities for photocopying, microfiche reading and printing, and for making white print duplicates of maps
- sale of federally and provincially published topographic maps (Stellarton only).

The main library in the Halifax office was busy with an increased demand for information services and products during fiscal year 1984-85. Over 1,500 people made use of the library facilities. In addition, 716 telephone enquiries and 871 mail enquiries were answered. In addition to the regular librarian, two students and a part-time contract librarian were hired over the summer. Revenue from the sale of 1,492 maps, 8,522 pages of photocopying, 7,075 pages of microfiche prints and 889 white prints of map transparencies totaled $12,977 while sale of departmental publications generated $6,680. Over 5,500 publications release notices were mailed out, 386 interlibrary loans were processed, 572 documents were catalogued, and 234 supply orders were placed.

Metallic Minerals

Gold Resource Project. The Gold Resource Project funded through the CNSMDA was begun in December 1984. The objective of the project is to produce a comprehensive compilation and review of the distribution and character of gold and other precious metals in the stratigraphic column of the province. The project will demonstrate the diversity of geologic environments in which precious metals occur, and emphasize the economic potential of each.

The current phase of the project involves a complete review of the literature on precious metals in the Province. This review has been greatly facilitated through the use of the bibliography of gold which is nearing completion by Mineral Inventory staff. In excess of 1300 references and articles have been identified. Important locations will be visited and sampled to further document the mineralization.

Mineral Inventory

The Mineral Inventory group is responsible for the collection, verification, organization, and dissemination of mineral resources information. The main functions of the group are twofold, namely: to verify that submitted exploration assessment reports comply with the Rules and Regulations of the Mineral Resources Act for the purpose of renewing exploration licenses, and to establish and maintain databases of mineral resources information and to publish pertinent compilations of mineral resources information of use and available to the Department, other government agencies, the mineral exploration industry, and the general public.

Canada-Nova Scotia Mineral Development Agreement 1984-89 (CNSMDA). As a result of funding obtained under the CNSMDA, as well as funding obtained under the 1984 Provincial Summer Employment Program, seven projects employing 12 people were initiated and completed in fiscal year 1984-85. These

projects were: the GEOSCAN Petroleum Exploration Assessment Reports Project; the GEOSCAN Journal Literature Project; the GEOSCAN Records Standardization Project; the GEOSCAN Data Entry Project; the Mineral Occurrences Data Bases Project; the Drillholes Data Base Project; and the Gold Pamphlet Project.

GEOSCAN Petroleum Exploration Assessment Reports Project. Ninety-one onshore petroleum assessment reports and 270 offshore petroleum well reports, received by the Department between 1968 and 1984, were organized, indexed, and entered into GEOSCAN, the national bibliographic database for geological information. Twenty-two of the 91 onshore reports were nonconfidential, have been microfilmed, and are available on microfiche in the departmental libraries. One hundred nineteen offshore well reports were nonconfidential and can be consulted in hard copy in the Petroleum Section at the Halifax office.

GEOSCAN Journal Literature Project. Some 1,739 references to Nova Scotia's geoscience journal literature were identified. Of these, 843 were obtained in hard copy and indexed for data entry into GEOSCAN. The number of references entered into GEOSCAN WAS 755. The 843 references obtained in hard copy form a file accessible by the public.

GEOSCAN Records Standardization Project. Indexing changes were necessary because new operating software was adopted that supports the GEOSCAN database. In preparation for making GEOSCAN publically available through commercial vendors of on-line databases, it became necessary to standardize the use of indexing terms used by the Department to code records over the past 10 years. This work is in progress and 3,596 records of a total of 4,493 have been standardized to date.

GEOSCAN Data Entry Project. In order to keep on-line data entry into GEOSCAN up-to-date with the volume of indexed code sheets generated by the previously described GEOSCAN projects, a full-time data entry operator was hired. During fiscal year 1984-85, 386 assessment reports, 149 publications, 36 open file reports, 20 open file maps, 641 journal literature references, and 129 theses were added to the database.

By the end of fiscal year 1984-85, GEOSCAN contained 7,140 departmental records, consisting of:

Assessment Reports	—	3,472
Publications	—	1,536
Journal References	—	1,070
Open File Reports	—	535
Theses	—	507
Open File Maps	—	20

Mineral Occurrences Databases Project. A metallic mineral occurrences database and an industrial mineral occurrences database have been produced from selected information, compiled up to 1980, taken from the metallic and industrial mineral occurrences data card files. The metallic mineral occurrences database contains information on 894 mineral occurrences, recorded in 27 data fields; the industrial mineral occurrences database contains information on 1,042 mineral occurrences, recorded in 20 data fields. Collectively, the data fields provide information on occurrence location, mineralization, production, assays, and geological characteristics. The mineral occurrences databases are supported on computer facilities of the Maritime Resource Management Service (MRMS) in Amherst, Nova Scotia. Searches of the databases can be obtained upon request through MRMS on a fee-for-service basis.

Open File Reports 599, 600, and 601, Metallic Mineral Occurrences Map and Data Compilation for Central (11D, 11E), Eastern (11F, 11G, 11J, 11K, 11N) and Western (20O, 20P, 21A 21B, 21H) Nova Scotia were released in December 1984. Similar open file reports (OFR 606, 607, and 608) are under preparation for the industrial mineral occurrences.

Drillhole Database Project. Information taken from exploration assessment reports has been used to create a database of drillhole information. The data base consists of 31 data fields which collectively provide information on drillhole location, mineralization, assays, and drillhole characteristics (e.g., logs, depth, year). Approximately 1,600 assessment reports, representing all the assessment reports cited in **Report 81-7 Index to Drillhole and Well Data 1862-1980,** plus open assessment reports for 1981, have been fully coded. Searches of the database can be obtained upon request through MRMS on a fee-for-service basis.

Gold Pamphlet. In co-operation with the Education and Public Awareness group of the Mineral Resources Division, a pamphlet entitled **Gold in Nova Scotia** has been written, and is in the final stages of preparation.

Nova Scotia Department of Mines and Energy Documents in GEOSCAN. Indexing and on-line data entry of Nova Scotia Department of Mines and Energy documents continued throughout fiscal year 1984-85. The following documents were added to the data base in fiscal year 1984-85:

Assessment Reports	—	386
Publications	—	142
Open File Reports	—	20
Open File Maps	—	15

Gold Bibliography. Compilation of information for the gold bibliography, to be entitled **Gold in Nova Scotia: a Bibliography of the Geology, and Exploration and Mining Histories from 1832 to 1985,** is well advanced, and publication is expected early in 1986. The bibliography will contain over 1,200 references, covering approximately 265 documented gold occurrences and gold districts.

STELLARTON OFFICE ACTIVITIES

The Resource Geology Section maintains a Regional Office in the Department's building on Bridge Avenue in Stellarton, Pictou County. Responsibilities and activities conducted by regional office staff are liaison with, and monitoring of, the mineral exploration industry (with an emphasis on metallic minerals); supervision and operation of the drill-core library; in-house technical support services and equipment storage; maintenance of geotechnical data and samples; library services; and inventory, distribution and sales of maps and publications. The permanent staff consists of two geologists, one surveyor, two mineral technicians and a stenographer/librarian.

Drill Core Library

Core Storage Facilities. Core library facilities consist of three buildings erected in 1982-1983 in the Stellarton Industrial Park, one building in the Debert Industrial Park, Colchester County, one building near Malagawatch, Inverness County, and sheds and core racks at the Bridge Avenue, Stellarton office.

During the 1984-1985 fiscal year, 203,126 feet (61 911 m) of drill core from more than 1,076 holes drilled during the years 1969 to 1985 were received for inclusion in the core library collection and were stored in the Stellarton Industrial Park facility (see Table 6). Almost 60 per cent of the total 120,400 feet (36 698 m) was derived from industry exploration and development work in the period 1969-1979. Over 65,600 feet (20 000 m) of core were given to the Department from drilling programs conducted by industry in 1980-1984. During the fiscal year 1984-85, 15,510 feet (4 727 m) of diamond-drill core was produced by the Department's drills. In some cases, core is incomplete due to spillage, deterioration or vandalism. Full details of holes and amounts of core on hand may be obtained from core-library personnel.

The program of drill core acquisition from current and past diamond drilling is continuing. During the 1984-85 fiscal year two provincial emloyment programs, provided funds to employ a total of eight assistants to help collect, sort, and catalogue the core.

During the year approximately 82,020 feet (25 000 m) of palletised drill core previously stored outside the Debert building were transferred to the new buildings in the Stellarton Industrial Park. All core is now stored inside the several core library buildings.

In March 1985, all drill core obtained from offshore petroleum exploration drilling was transferred to the Canada Oil and Gas Lands Administration (COGLA) core library at the Bedford Institute of Oceanography, Dartmouth.

New laboratory facilities at the Stellarton Industrial Park buildings consisting of core benches, rocksaw benches, sink, storage cupboards and shelves and a small office came into use.

Geotechnical Data and Sample Storage. Much of the departmental collection of geological samples are stored either in the Stellarton or Debert core library buildings. During the year an additional four sample cabinets, equipped with sample storage trays, were installed alongside the 13 cabinets originally set up in 1983 inside the main Stellarton building on Bridge Avenue. Vials containing chip samples from off-shore petroleum exploration drilling were transferred to six of these cabinets. Bulk samples of chips corresponding with the vial samples were transferred to COGLA at Bedford Institute of Oceanography, Dartmouth.

Sample pulps from the Yava Mine (closed in 1981) were sorted, listed, and packed in storage trays, while files and maps from the same mine await processing and proper storage.

All original paper copies of nonconfidential mineral exploration assessment reports, theses, and open file reports were transferred from the Halifax office to Stellarton for long-term storage. The section maintains a substantial collection of maps, files and reports for reference purposes at the Stellarton office, including a complete set of metallic mineral occurence data (MOD) cards.

Rock and mineral displays and assistance were provided for the Forestry Exhibition in Windsor, the Rockhound Roundup in Parrsboro, and the Gold Rush Days at Caledonia, Queens County.

A collection of rocks and minerals is also maintained in Stellarton for preparation of small sets of representative specimens for teachers and students.

Exploration Monitoring

Monitoring of mineral exploration activity is carried out by the Resource Geology Section of the Mineral Development Division. Staff assigned to this program consist of two geologists based in the regional office at Stellarton.

The program of exploration monitoring provides a direct liaison with industry through which the Department is able to maintain an awareness of current exploration activities throughout the Province. The monitoring process provides continuous contact with industry personnel through regular visits to company offices and exploration sites. Problems and difficulties that may need addressing by the Department are identified and assistance or advice is provided if necessary. In addition, the monitoring staff review assessment and other reports submitted by industry and prepare an annual statistical study of the exploration industry in the Province. Reports, maps, compilations, and tabulations are prepared to summarise industry activity, many of which are included in the annual Mines and Minerals Branch **Report of Activities**.

Technical Support Services

Surveying. All diamond drillholes drilled by the Department are surveyed for location and elevation and are tied into the LRIS survey monuments. Detailed data are on file at the Stellarton office. All departmental drilling and location information is compiled into an annual publication **Drilling Logs of Government Core Drills.** In addition to locations, "Tropari" surveys are also performed in all departmental drillholes by the surveyor to determine hole orientation and deviation. During the fiscal year 1984-85, other surveys were performed at the following locations:

- Pine Brook, Richmond County (Novex barite quarry)
- Drummond Mine, Westville, Pictou County (Pioneer Coal)
- Upper Brookfield, Colchester County (Nystone barite quarry)
- Scotch Lake, Cape Breton County (Scotia Limestone drillholes)
- West Gore, Hants County
- Stellarton Core Library, Pictou County
- Penny Mountain, Colchester County (Canada Cement drillholes)
- Scotsville, Inverness County (Scotsville barite quarry)

Camp Support and Equipment Storage. Assistance is provided to departmental personnel for inventory and storage of geological, survey, and field equipment and supplies, and for setting up and closing down of field camps. Transportation for equipment between offices and field camps is provided.

Publications Storage. Stockpiles of departmental publications (reports and maps) are maintained at the Stellarton office and distributed as required.

Map Sales. The Stellarton office is an agent for Maritime Resource Management Service (MRMS), the principal map dealer in Nova Scotia for the Canada Map Office, Energy, Mines and Resources, Canada. Topographic, geological and aeromagnetic maps are sold through the library at Stellarton.

PRIVATE SECTOR EXPLORATION AND DEVELOPMENT ACTIVITY

Exploration Activity

Exploration activity in the Province during calendar 1984 was up slightly from the previous year with total expenditures estimated at roughly $7,300,000. Interest focused primarily on the exploration for gold, tin and tungsten and to a much lesser degree copper, lead, zinc and barite. A large increase in the level of gold exploration was recorded in 1983 as economic conditions improved and this level of activity was generally maintained through 1984. The current development work on the Rio Algom tin mine at East Kemptville, which is expected to be in production by late 1985 has helped to sustain continued exploration for similar base metal deposits.

New major exploration companies in the Province include Durham Resources Inc., BP Exploration Canada Ltd. (BP/Selco Canada Ltd.), and Inco Ltd. Inco Ltd. is the operating company for a new joint venture formed in 1984 between Inco Ltd., Kennco Explorations Canada Ltd., Husky Oil Operations Ltd., and Canadian Offshore Resources Exploration Ltd. (COREL). The joint venture is known as the Scotian Mineral Exploration Venture (SCOMINEX) and is funded initially for three years at a total $3,000,000, primarily for gold exploration. New junior companies operating in the Province are Scotsville Mineral Resources Ltd., Bigstone Minerals Ltd., Victoria County Explorations Ltd., Onitap Resources Inc., Meguma Gold Corporation Ltd., Athol Exploration Syndicate, and Anglo Canadian Mining Corporation.

Gold Exploration. Exploration in the historic gold districts of mainland Nova Scotia continued to dominate the search for precious metals in the Province during 1984 (Fig. 4). Attention focused primarily on the gold-bearing quartz veins of the Cambro-Ordovician metasedimentary sequence of the Meguma Group. Most of the significant exploration programs during the year were carried out by junior companies through continuing programs of geochemical and geophysical surveys, geological mapping, trenching, bulk sampling, and diamond drilling.

Seabright Resources Inc. continued a large-scale exploration program on its Forest Hill property in Guysborough County consisting of geochemical and geophysical surveys, bulk sampling, and diamond-drilling. The company also completed diamond-drilling on its Mill Village and Westfield gold properties in Queens County and continued a detailed feasibility study on recovering gold from old tailings sites throughout the Province. Goldenville Explorations Ltd. also continued a large-scale exploration program on its Goldenville property in Guysborough County consisting of diamond-drilling and surface bulk sampling.

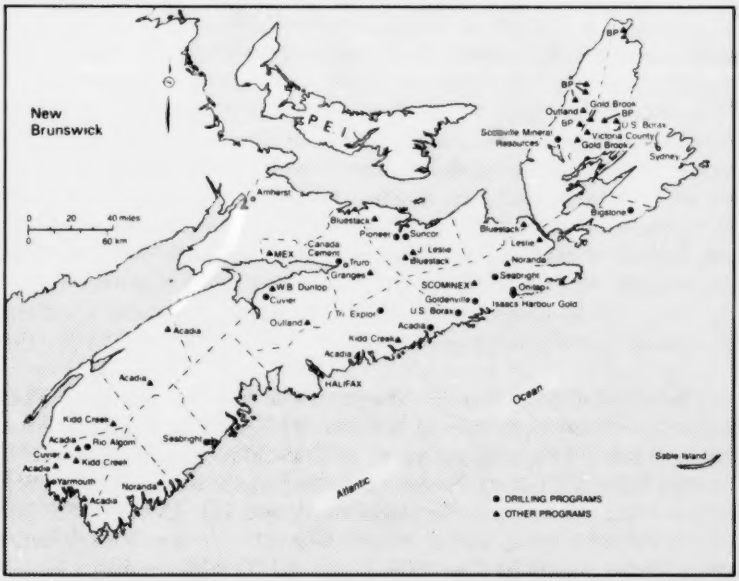


FIGURE 4. Locations of private sector gold and base metal exploration programs.

A small crusher and concentrating facility was set up on the property. Victoria County Explorations Ltd. carried out a detailed exploration program at Second Gold Brook, Victoria County consisting of geological mapping, trenching and driving an exploration adit. Northumberland Mines Ltd. (under Scominex funding) collected bulk samples at Cochrane Hill.

Other drilling programs were undertaken by Acadia Mineral Ventures Ltd. (under Scominex funding) at Miller Lake, Guysborough County; by U. S. Borax and Chemical Corp. (option from Sulpetro Minerals Ltd.) at Salmon River (Dufferin Mines), Halifax County; Scominex (option from Northumberland Mines) at Cochrane Hill; and Onitap Resources Inc. at Goldboro, both in Guysborough County. Outland Resources Corp. and Anglo Canadian Mining Corporation continued an exploration program at Renfrew, Hants County, consisting of geochemical and geophysicl surveys, trenching, and underground bulk sampling.

Smaller projects were also conducted throughout the Province by several companies. Geochemical surveys were completed by Cuvier Mines Inc. in Yarmouth County, Acadia Mineral Ventures Ltd. on several properties in Yarmouth and Annapolis counties, and Noranda Exploration Company Ltd. in Shelburne County. Geophysical surveys were conducted by Lake Mine Resources Inc. at Caribou, Halifax County, and by Gold Brook Developments Limited in the Cape Breton Highlands.

Base Metal Exploration. Exploration for tin and tungsten continued to highlight exploration for base metals in Nova Scotia during 1984 (Fig. 4). Following the discovery of the East Kemptville, Yarmouth County, tin deposit by Shell Canada Resources Ltd. in 1980, several companies have continued large-scale projects to explore for similar economic deposits. Most of the exploration for tin and tungsten was carried out by the major companies; work consisted primarily of reconnaissance and detailed till sampling, prospecting, overburden drilling (auger drilling), and diamond-drilling.

In addition to development work on the East Kemptville tin deposit, Rio Algom Ltd. continued exploration on the property in the area west and southwest of the deposit, consisting of till sampling, geophysical surveys, and diamond-drilling. Billiton Canada Limited continued a large-scale exploration program for tin in the Jeromes Lake area, Yarmouth County, consisting of detailed till sampling and a large overburden drilling program. Kidd Creek Mines Limited continued a detailed exploration program for tungsten in the Tangier-Grand Lake area of Halifax County. This company also carried out a small exploration program for tin and tungsten near Pearl Lake, Yarmouth County, and conducted geological and geochemical surveys over a large group of claims in Digby County and surrounding areas.

A large exploration program for tin, tungsten, and base metals was continued in several areas of the Cape Breton Highlands by B.P. Exploration Canada Limited. The work consisted of geological mapping, geochemical, and geophysical surveys and trenching. Exploration for tin and tungsten as well as precious metals was carried out by Cuvier Mines Inc. near East Kemptville and by Acadia Mineral Ventues Ltd. in Kings and Annapolis Counties.

Exploration for copper, lead and zinc continued at reduced levels in comparison with 1981 and earlier years.

Granges Exploration Limited continued their evaluation of the Smithfield Pb-Zn deposit with additional drilling in 1984. Bigstone Minerals Limited began an evaluation of the Stirling massive sulphide deposit in Richmond County. The Company carried out geophysical surveys and diamond drilling. BP Exploration

Canada Limited (Selco/Bluestack joint venture) continued a detailed follow-up program of a regional geochemical survey in northeastern mainland Nova Scotia consisting of detailed geochemical surveys, geological mapping, and basal till sampling. Gold Brook Developments Ltd. conducted a small exploration program for base metals at Campbell Brook, Inverness County.

Barite Exploration. Exploration levels for barite were significantly lower than the previous year. The majority of the work was undertaken by junior companies with the remaining work being undertaken by individuals. Cuvier Mines Inc. carried out a diamond-drilling program as part of a continuing exploration program in the Walton area of Hants County. Geochemical surveys were done by MEX Exploration Ltd. in the Five Islands area and by Scotsville Mineral Resources Ltd. at Lake Ainslie, Inverness County. J. A. Leslie and Associates completed a detailed geochemical program near Bridgeville, Pictou County and a smaller project at Byers Brook, Guysborough County. A detailed feasibility study was also undertaken on the Walton deposit by a group representing W. B. Dunlop Ltd.

Coal Exploration. Exploration for coal in the Province was undertaken by both government and industry. The Department continued a detailed diamond drilling and down-hole geophysics program at three localities: Springhill, Cumberland County; St. Rose, Inverness County; and Thorburn, Pictou County. A large exploration program was continued by Suncor Inc. in the Stellarton-New Glasgow area during 1984 which consisted of diamond drilling and down-hole geophysics, methane desorption studies, and a geological review and update of the Pictou coal field.

Uranium Exploration. In March 1985, the moratorium on exploration for uranium, in effect since 1981, was extended a further five years.

MINING DEVELOPMENT

Development work was undertaken on several projects throughout the Province during 1984. Commodities under current development include coal, tin and barite.

Coal. The Cape Breton Development Corporation continued development work on several projects in the Sydney coal basin under a federal government initiatives program exceeding $300 million. These projects include the Donkin project (tunnelling and bulk sampling), the 1B mine (rehabilitation studies), and the Lingan/Phalen project (development work on the Phalen seam).

Pioneer Coal Company Ltd. commenced development of open-pit operations at Westville, Pictou County and continued exploration work to extend reserves that are now in production. The company completed a detailed drilling program on part of the former Drummond mine property in early 1985 as part of this program.

Suncor Inc. is currently undertaking feasibility studies related to future mine development on their coal exploration program in the Pictou coal basin.

Tin. Development work on the East Kemptville tin deposit owned by Rio Algom Ltd. has continued on schedule with initial production expected by the end of 1985. The mine is expected to operate at 9,900 tons/day (9000 tonnes/day) at full capacity with an annual output of approximately 3.6 million tons (3.3 million tonnes) of ore. Mineable reserves are estimated at 62 million tons (56 million tonnes) grading 0.16 per cent tin with copper and zinc to be produced as a byproduct.

Barite. Scotsville Mineral Resources Ltd. initiated development work on their barite property at Scotsville, Inverness County. Detailed diamond-drilling and sampling was carried out prior to the opening of an open-pit and the erection of a small crusher and jig concentrating plant. Conwest Explortion Company Ltd. continued feasibility studies on the Trout Brook barite-fluorspar deposits just south of the Scotsville development.

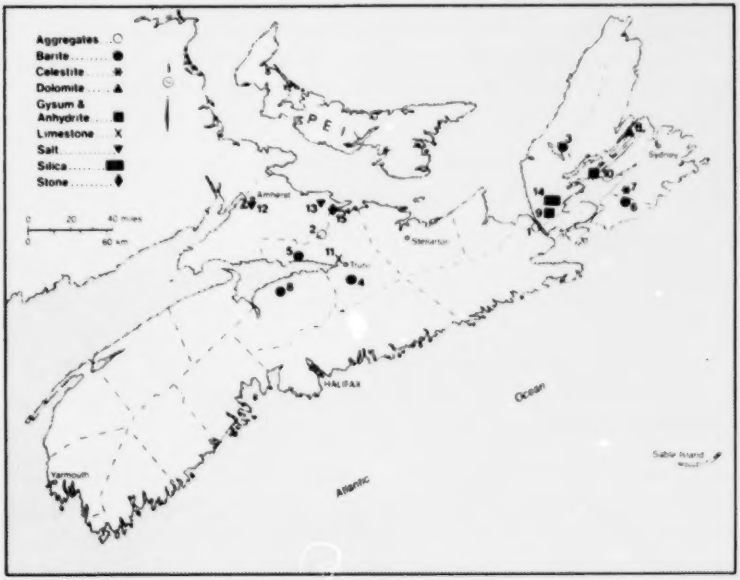
Nystone Chemicals Ltd. continued development work on the Brookfield barite deposit and set up a jig concentrating plant for the production of both mud and pharmaceutical grade barite. Novex Mining and Exploration Company Limited continued their mining and development work on the Pine Brook barite deposit in Richmond County but terminated operations during the year.

INDUSTRIAL MINERALS DEVELOPMENT AND PRODUCTION OVERVIEW

Industrial mineral activity in the private sector continued at a high level for 1984 with value of production reported at $134.9 million up 9.7 per cent from 1983. Significant production increases were reported for anhydrite, barite, limestone and silica sand with slight increases reported for aggregates, gypsum, salt, and peat moss. (See Appendix B, Tables B-2, B-3, B-4).

The following are highlights related to Industry activity during 1984. Major exploration and development programs are shown on Figure 5.

Aggregates. Exports of aggregate materials increased substantially primarily due to Construction Aggregates Limited of Mulgrave successfully marketing crushed



	Property	Activity
1	Construction Aggregates Ltd.	aggregate exports to U.S.A.
2	Permanent Concrete Ltd.	aggregate exports to several Eastern Canadian Markets
3	Scotsville Mineral Resources	open-pit mine development
4	Nystone Chemicals Ltd.	drill mud barite production
5	Magcobar Division, Dresser Canada Inc.	drill mud barite production continued
6	Nova Scotia Department of Mines and Energy	exploration tender called on the Pine Brook Barite Property
7	Nova Scotia Department of Mines and Energy	development tender called on the MacRae celestite deposit
8	Scotia Limestone Ltd.	dolomite production began
9	Georgia Pacific Corp., Bestwall Division	quarry development continued
10	Little Narrows Gypsum Co. Ltd.	road construction to new gypsum deposit completed
11	Canada Cement Lafarge Co. Ltd.	diamond-drilling on a limestone deposit
12	Sifto Salt Division, Domtar Chemicals Group	plant modernization program well underway
13	Canadian Salt Company Ltd.	Provincial highway upgrading to improve truck transportation
14	Nova Scotia Department of Mines and Energy	exploration tender called on the Diogenes Brook silica deposit
15	Wallace Quarries Ltd.	feasibility study and diamond drilling in preparation for quarry reopening

FIGURE 5. Locations of private sector industrial minerals exploration and development programs.

stone into several United States ports including Savannah, Georgia and Houston, Texas. Aggregate shipments to the Houston market were moved aboard the *M/V Marcona Conveyor* in 55,100 tons (50 000 t) shipments. A smaller vessel, *Tinnes,* was used to service the Savannah market. Later in the year Construction

Aggregates Limited began constructing a new dock to improve loading capability for larger ships. The company continued shipping aggregates to Prince Edward Island by barge throughout 1984.

In November Nova Scotia Permanent Concrete shipped aggregate materials from their Folly Lake deposits to other eastern provinces by rail, truck, and barge. Barges are loaded at Wallace, Cumberland County mainly serve the Prince Edward Island Market.

Barite. Scotsville Mineral Resources Ltd. at Scotsville, Inverness County began production, mining 9,367 tons (8 500 t) of barite ore before temporarily closing down for the winter months. Scotsville shipped approximately 220 tons (200 t) of barite and were able to set up most of the equipment to process the mined ore to drill mud grade standards. Activities on site will resume when weather conditions improve.

Magcobar Division, Dresser Canada Inc. continued mining barite at Bass River, Colchester County. Approximately 3,306 tons (3 000 t) of mineable barite were recovered and shipped to Walton, Hants County and to Mosher Limestone at Upper Musquodoboit for grinding.

Nystone Chemicals Ltd., using a jig, produced 5,510 tons (5 000 t) of drill mud grade barite from their Upper Brookfield, Colchester County deposit. The company also continued to use the Brookfield ore to produce pharmaceutical barite at their processing plant in Debert, Colchester County.

Novex Mining and Exploration Co. Ltd. operated their barite mine at Pine Brook, Richmond County and their mill at Enon, Cape Breton County until August, 1984 at which time operations ceased.

Dolomite. Dolomite production began at Kellys Cove, Victoria County by Scotia Limestone. Nova Construction was contracted to quarry, crush and ship the stone to the Sydney Steel Corporation. Shipments amounted to 16,530 tons (15 000 t).

Limestone. Canada Cement LaFarge Ltd. explored for high lime (>50% CaO) deposits in the central and northern mainland region of the Province. Late in 1984 a diamond-drilling program was completed in known limestone occurrences at Upper Brookside and East Mountain, Colchester County. Additional work on the Upper Brookside deposit is slated for 1985.

Gypsum and Anhydrite. Georgia-Pacific Corporation continued development work on their Sugar Camp gypsum property. Surface development work

included overburden removal from the south end of the deposit, road construction, and maintenance facility construction.

Little Narrows Gypsum Company continued development of their new gypsum deposit two miles northeast of their present quarry. A new haul road was constructed to the site and stripping started.

Salt. Sifto Salt, under an Atlantic Energy Conservation Investment Program (AECIP) grant, began an $9 million program to modernize their plant at Nappan, Cumberland County. This will allow for lower production costs and will permit them to become more competitive in a highly competitive market.

Canadian Salt Company at Pugwash, signed an agreement with the provincial government to upgrade the highway from the mine site to the Trans-Canada Highway which will allow increased weight of truck shipments.

Stone. In response to several inquiries into the availability of sandstone for restoration work in Halifax and in the northeastern United States and the possibility of supplying stone for new buildings in Ottawa, a feasibility study for reopening the Wallace quarry was commissioned by the company, Wallace Quarries Ltd. This study was followed with a diamond-drill program in preparation for quarrying. Later in the year The South Western Stone Cleaning and Restoration Co. Ltd. of Bristol, England was awarded a cleaning and restoration contract for the exterior of the Nova Scotia Provincial Legislature Building. The Wallace Quarry will be reopened to supply the required stone.

TABLE 6. Drill core acquisitions to the core library, Stellarton for the 1984-85 fiscal year.

NTS	Company or Organization	Year Drilled	Commodity	Location, County	No. of Holes	Hole Names	Core Size	Total Feet	Total Metres
11-D-14	Getty Mines Ltd.	1973-1976	Pb, Zn	Meagher's Grant, Halifax	61	MG-1 to MG-71	BQ, AQ	9,253	2 820
11-D-14	Riocanex Ltd.	1973	Pb, Zn	Antrim, Halifax	7	A3 to A9	BQ	1,313	400
11-D-16	Sulpetro Minerals Ltd.	1981	Au	Dufferin Mine, Halifax	2	235-1 to 235-2	BQ	747	228
11-D-16	U.S. Borax & Chemical Corp.	1984	Au	Dufferin Mine, Halifax	3	BSD-1 to BSD-3	BQ	1,337	408
11-E-2	Sulpetro Minerals Ltd.	1981	Au	Wire Lake, Halifax	3	229-1 to 229-4	BQ	729	222
11-E-2	Comiesa Corporation	1981	Au	Beaverdam, Halifax	1	BD-80-10	BQ	332	101
11-E-3	Imperial Oil Ltd./ Jorex Ltd.	1973	Pb, Zn	Chaswood, Halifax	7	CH-73-1 to CH-73-8	BQ	545	166
11-E-3	Imperial Oil Ltd./ Jorex Ltd.	1973	Pb, Zn	Coldstream, Colchester	7	MA-73-1 to MA-73-9	BQ	1,024	312
11-E-3	Getty Mines Ltd.	1973-1976	Pb, Zn	Gays River, Halifax	215	GGR-1 to GGR-233	BQ	41,843	12 753
11-E-4	Imperial Oil Ltd./ Jorex Ltd.	1973	Pb, Zn	Nine Mile River, Hants	7	NM-73-4 to NM-73-29	BQ	1,067	325
11-E-4	Borcan Resources Ltd.	1982	Au	Renfrew, Hants	6	B-82-1 to B-82-6	BQ	806	246
11-E-4	Art Wright	1983	Au	Renfrew, Hants	9	1-H-83 to 9-H-83	BQ	1,395	425
11-E-4	NSDME	1984	geology	Clarksville-West Gore, Hants	1	C-1	HQ, NQ, BQ	1,864	568

NTS	Company or Organization	Year Drilled	Commodity	Location, County	No of Holes	Hole Names	Core Size	Total Feet	Total Metres
11-E-6	Esso Minerals Canada	1977-1978	base metal	Smithfield, Colchester	4	SF50 to SF56	BQ	328	100
11-E-6	Granges Exploration Ltd.	1984	base metal	Smithfield, Colchester	4	GS-16-84 to GS-19-84	NQ	3,704	1 129
11-E-6	Esso Minerals Canada	1978	base metal	Brookfield, Colchester	2	BF-1, BF-2	BQ	115	35
11-E-8	NSDME	1984	geology	College Grant, Antigonish	1	LC-83-4	BQ	95	29
11-E-9	Esso Minerals Canada	1978	base metal	Ohio, Antigonish	1	OH-14	BQ	20	6
11-E-10	NSDME	1984	coal	Thorburn, Pictou	1	P56	NQ	70	21
11-E-10	Suncor Inc.	1983	coal	New Glasgow, Pictou	7	AP-83-0370 — AP-83-0377	HQ, NQ	16,422	5 005
11-E-10-11-E-14	Esso Minerals Canada	1981-1982	base metal	Caribou River, Pictou to Amherst, Cumberland	19	P25 to P60	BQ	6,165	1 879
21-H-9, 21-H-16									
11-E-12	Amax Minerals Exploration	1979	potash	Oxford, Cumberland	2	OX-1-79 to OX-2-79	HQ, NQ	3,146	959
11-E-13	NSDME	1984	coal	Roslin, Cumberland	1	R-1	NQ, BQ	410	125
11-E-13	Esso Minerals Canada	1982	Cu	Canfield Creek, Cumberland	12	P-61 to P-73	BQ	3,682	1 122

TABLE 6. Continued

NTS	Company or Organization	Year Drilled	Commodity	Location, County	No. of Holes	Hole Names	Core Size	Total Feet	Total Metres
11-F-4	Outland Resources Corp.	1983	Au	Widow Point, Guysborough	7	WP.83.1A to WP.83.11	NQ	1,253	382
					44	WP.83.1 to 58 (Auger)	BQ	627	191
11-F-4	Isaac's Harbour Gold Expl. Inc.	1984	Au	Goldboro, Guysborough	8	IH-1-84 to IH-8-84	BQ	1,834	559
11-F-4	Onitap Resources Inc.	1984	Au	Goldboro, Guysborough	1	BR-84-1	NQ, BQ	1,680	512
11-F-5	Seabright Resources Inc.	1982-1983	Au	Forest Hill, Guysborough	13	82-1 to 83-5	NQ	7,043	2 147
11-F-5	Mile Lake Joint Venture	1980	Au	Mile Lake, Guysborough	4	ML-80-2A to ML-80-4	NQ	469	143
						ML-82-10	BQ	83	25
11-F-9	Amax Minerals Exploration	1981	base metal, Au, Ag	Framboise, Richmond	6	AF-1-81 to AF-6-81	NQ, BQ	2,106	642
11-F-10	U.S. Steel (Essex Minerals)	1969	Cu	Sporting Mountain, Richmond	12	SP-4 to SP-23	NQ, BQ	435	132
11-F-14	Brascan Resources Ltd.	1975-1976	Zn	Lime Hill, Inverness	24	B-1 to B-25	AQ	3,986	1 215
11-F-16	John Riddell	1981	base metal	Oceanview Road, Cape Breton	2	BM-81-14, BM-81-15	BQ	533	162
11-K-1	Scotia Limestone Ltd.	1984	dolomite	Scotch Lake, Cape Breton	16	SL-1-84 to SL-17-84	BQ	814	248

NTS	Company or Organization	Year Drilled	Commodity	Location, County	No. of Holes	Hole Names	Core Size	Total Feet	Total Metres
11-K-1	Aquitaine Co. of Canada Ltd.	1976	base metal	Coxheath, Cape Breton	8	AC-1 to AC-8	BQ	2,520	768
11-K-1	NSDME	1984	geology	Point Edward, Cape Breton	1	PE2	HQ, NQ	1,447	441
11-K-2	NSDME	1984	geology	Woodbine Road, Cape Breton	2	WR1, WR2	NQ	997	304
11-K-6	NSDME	1984	engineering, coal	Kempt Head, Victoria	1	KH-1	HQ, NQ, BQ	3,084	940
11-K-7	Sulpetro Minerals Ltd.	1981	base metal	St. Rose, Inverness	8	SR6 to SR12	NQ	3,856	1 175
11-K-8	NSDME	1985	engineering, coal	Sarach Brook, Victoria	2	227-1, 227-2	BQ	605	184
11-K-10	Getty Mines Ltd.	1974-1975	base metal	Point Aconi, Cape Breton	5	SM24 to SM28	NQ	341	104
20-O-9	EMR-Earth Physics Branch	1985	research	Cheticamp, Inverness	2	CH-1, CH-2	BQ	2,269	691
21-A-2	Seabright Resources Inc.	1984	Au	Wedgeport, Yarmouth	1	EPB-18 (85)	BQ	1,576	480
21-A-4	Esso Minerals Canada	198l-1982	Sn	Mill Village, Queens	10	MV-84-1 to MV-84-10	NQ	1,921	586
21-A-6	Whiteburn Precious Metals Ltd.	1982	Au	Pearl Lake, Yarmouth	18	PL-4-81 to PL-21-81	BQ	6,600	2 012
21-A-9	Shell Canada Resources Ltd.	1980	Sn, W, Mo	Whiteburn, Queens	5	WH-1-82 to WH-5-82	BQ	1,439	439
				Henry Lake, Lunenburg	6	HL-1 to HL-6	BQ	2,033	620

TABLE 6. Continued

NTS	Company or Organization	Year Drilled	Commodity	Location, County	No. of Holes	Hole Names	Core Size	Total Feet	Total Metres
21-H-1	M.E.X. Explorations Ltd. Magcobar-Dresser	Various	Ba, base metal, Ag	Walton Mine, Hants	460	Various	ND	50,199	15 300
21-H-9	NSDME	1984	coal	Springhill-Saltsprings, Cumberland	4	SH-96 to SH-98, SS8	NQ, BQ	3,344	1 019
ND	Amax Minerals Exploration	1978	ND	ND	2	B-1-78, B-2-78	BQ	275	84
ND	Amax Minerals Exploration	1980	ND	ND	4	AF-3-80 to AF-6-80	BQ	625	191
ND	AMax Minerals Exploration	ND	ND	ND	ND	ND	BQ	140	43
ND	Getty Mines Ltd.	ND	ND	ND	4	PE-1 to PE-4	BQ	513	156
ND	Getty Mines Ltd.	1973	BM	Gays River, Meaghers Grant, Halifax	ND	ND	BQ	470	143
ND	Imperial Oil Ltd./ Jorex Ltd.	1973	BM	ND	6	HW-73-1 to HW-73-7	BQ	416	127
	Esso Minerals Canada	ND	ND	ND	7	MB1, MB2, DDH 1-4	BQ	1,181	360
							TOTAL	203,126	61 910

ENERGY BRANCH

J. R. Hornby, P.Eng., Assistant Deputy Minister

Nova Scotia is heavily dependent on petroleum for its everyday needs. Approximately 67 per cent of its primary energy comes from petroleum, most of which is imported from foreign sources.

The provincial government has established a clear objective to reduce this dependence by developing Nova Scotia's indigenous energy resources, by gaining access to Canada's energy resource base, and by improving the efficiency of energy use.

The mandate of the Energy Branch is to initiate and implement policies and programs to achieve the government's energy goals. The Branch consists of two divisions — Energy Resources and Energy Management. The Energy Resources Division focuses on the development of Nova Scotia's indigenous resources, particularly offshore oil and gas, coal, and peat. The Energy Management Division focuses on the acquisition of energy from outside the Province and the utilization of energy within the Province.

ENERGY RESOURCES DIVISION

A. G. Batcup, P. Eng., Director

INTRODUCTION

The Energy Resources Division is accountable for the effective evaluation, promotion, and regulation of Nova Scotia's energy resources. The Division has centered its activities in the two primary hydrocarbon resource areas: petroleum (oil and gas) and coal/peat.

During the 1984-85 fiscal year the activities of the Petroleum Resources Section increased considerably in scope as exploration and development interest in Nova Scotia's offshore oil and gas resources increased. In a year of peak offshore exploration activity, the Section was involved in the negotiating exploration agreements for new lands, monitoring land relinquishments, and drilling results. Delineation drilling continued for Venture Project reserves and four new significant gas and condensate discoveries were made. With a new Federal Government elected in the fall of 1984, the Section was also occupied in assessing the impact of new federal energy policies on exploration and development offshore Nova Scotia and on the Canada-Nova Scotia Offshore Agreement.

The Coal Resources Section was similarly active in evaluating and promoting the Province's coal and peat reserves. The Section has three major areas of activity: coal development and utilization, coal and peat exploration, and oil substitution programs. The Section has worked closely with both private and public organizations during the year to promote new mine development, as well as to initiate vital research and development, which will lead to greater demand for Nova Scotia coal both in traditional markets and in new applications.

Petroleum Resources Section

C. Andrew Parker, P. Eng., Manager

INTRODUCTION

The Petroleum Resources Section is responsible for monitoring, evaluating, and regulating petroleum exploration and development activities onshore and, in conjunction with the Nova Scotia office of the Canada Oil and Gas Lands Administration (COGLA), offshore Nova Scotia.

During the 1984-85 fiscal year, the Section's efforts were mainly concentrated on monitoring and evaluating offshore exploration and Venture Project development activities. Oil and gas exploration on the Scotian Shelf continued at a high level and progress was made in a number of areas associated with the Venture Project. The governments of Nova Scotia and Canada enacted legislation during the fiscal 1984-85 year which provides a framework for the orderly exploration, development, and production of Nova Scotia's offshore and onshore petroleum resources.

OFFSHORE EXPLORATION ACTIVITY

As of April 1, 1984, the Petroleum Resources Section had reviewed with COGLA, 33 different exploration agreements covering an offshore area of 29,384,233 acres (11 891 799 ha). These exploration agreements were ultimately approved by the Canada-Nova Scotia Offshore Oil and Gas Board, and concluded the first round of exploration agreements off Nova Scotia. A summary of these 33 exploration agreements is presented in Table 7.

During the 1984-85 fiscal year the Petroleum Resources Section and COGLA worked together on the first call for proposals in the second round of exploration agreements involving two blocks of land in the Sable Island area (see Fig. 6). The proposals were subsequently reviewed and Exploration Agreements

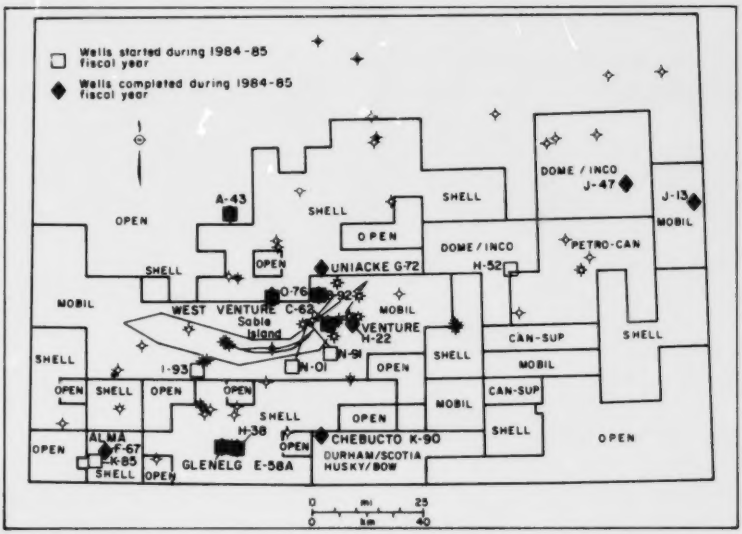


FIGURE 6. Wells completed during the 1984-85 fiscal year around Sable Island.

TABLE 7. Exploration Agreements (E.A.) Announced Since the Canada-Nova Scotia Agreement

Exploration Agreement Description	Area (Acres)	Area (hectares)	Number of Agreements	Number of Wells	Value $ Million	Date Announced
Shell — Slope	9,595,651	3,883,360	6	6	$ 263	June 4, 1982
Petro-Canada/Husky-Bow Valley — Esperanto	4,199,954	1,699,721	4	8	500	July 30, 1982
Shell — Shelf	4,849,945	1,962,773	7	9	551	September 23, 1982
Mobil — Sable Island (Terminated 1984-01-14)	1,145,750[2]	463,685	1	4	197	November 19, 1982
Mobil — South Sable and East Banquereau	2,430,309	983,546	2	2	110	November 19, 1982
Dome/Inco — East Sable	593,040	240,003	1	2	113	April 15, 1983
Dome — Northumberland	1,455,419	589,008	1	1	14	November 30, 1983
Mobil — Sable Island (New E.A. commenced 1984-01-15)	1,145,750[2]	463,685	2	5	284	May 7, 1984
Petro-Canada — Sydney) Petro-Canada/Canadian Superior — Shelf) Petro-Canada — Banquereau) Petro-Canada — Cabot Strait)	2,275,760	921,000	4	4	200	May 7, 1984
Onaping/Scotia Energy — Mohican and Chebucto	1,575,639	637,661	2	2	110	
Texaco — Albatross	281,097	113,760	1	1	38	- May 7, 1984
Shell/Canadian Superior — Shelf	229,800	93,000	1	1	36	
Scotia Energy/Onaping — Yarmouth	751,869	304,281	1	1	34	
TOTAL	**29,384,233**	**11,891,798**	**33**	**46**	**$2,450**	

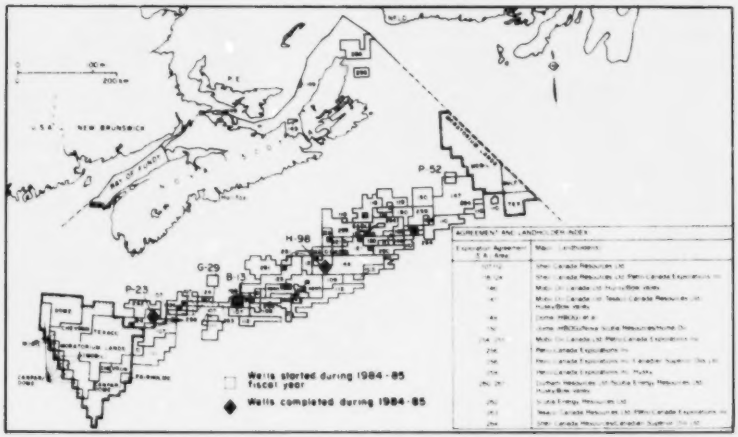


FIGURE 7. Wells completed during the 1984-85 fiscal year offshore of Nova Scotia.

were concluded with two consortiums. One was led by Husky Oil and the other by Canterra Energy.

Relinquishments of offshore lands to the Crown occurred throughout the fiscal year. Staff monitored and participated in the relinquishment of 6,542,937 acres (2 647 927 ha) of offshore lands. By the end of the 1984-85 fiscal year, approximately 90 per cent of the lands to be given up under the first round of exploration agreements will have been relinquished.

The boundary dispute between Canada and the United States on the Georges Bank was resolved in late 1984. This Section was involved in discussions with fisheries, environment, and the industry to determine under what conditions exploration on Georges Bank can proceed.

The level of activity for the fiscal 1984-85 year was the highest on record for offshore Nova Scotia. During this period 14 wells were spudded (seven of which were still drilling at the end of the fiscal year) and 15 wells were completed (including eight wells started in the previous fiscal year). The 15 wells completed included 11 wildcat wells, three delineation wells, and one relief well. Of the 11 wildcat wells completed, four wells, Uniacke G-72, Alma F-67, Chebucto K-90, and West Venture C-62 were gas and condensate discoveries, but require further delineation to evaluate their commercial viability. Of the three delineation wells drilled, Venture H-22 and Glenelg E-58A, were successful in delineating their respective structures (locations on Figs. 6 and 7).

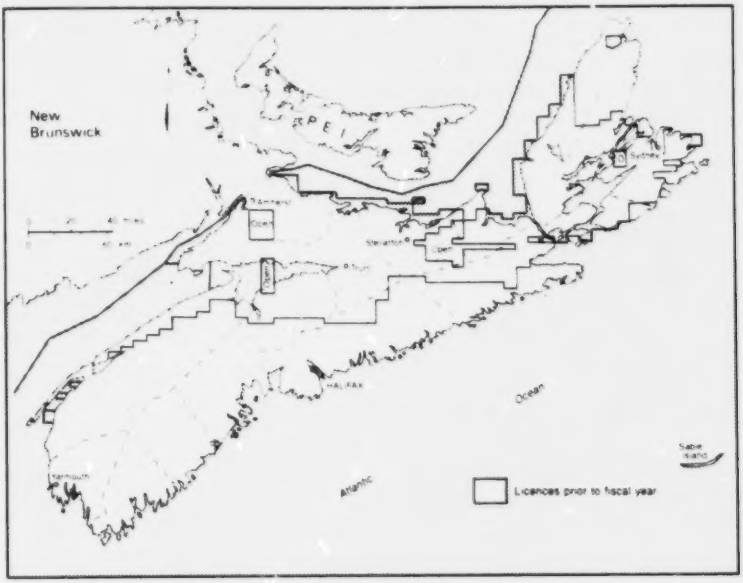


FIGURE 8. Onshore exploration licence locations.

Mobil's West Venture N-91 well encountered well control problems in September of the 1984-85 fiscal year. The Section, with COGLA, monitored the situation and an official inquiry was instituted by COGLA to look into the cause of the incident. Staff served on the team which carried out the investigation and prepared the final report. At the time of writing, steps were still underway to resolve the problem at West Venture N-91.

Mobil and its partners continued to evaluate and revise the Development Plan as new information became available on the Venture Project. Gas sales contracts were signed by United States gas buyers for the purchase of the gas from the Venture Project partners. Preparations were being made by Mobil and partners to submit their Export Application to the National Energy Board. Staff attended several meetings with their counterparts at Mobil to keep the Province informed of the latest developments on the Venture Project.

ONSHORE EXPLORATION ACTIVITY

No onshore petroleum wells were drilled and no licences were issued during the 1984-85 fiscal period. In July 1984 the existing Petroleum and Natural Gas Act

was repealed and replaced by the Petroleum Resources Act which cancelled all previous rights to the onshore region. This new Act permits all former licence holders to exercise a first right to negotiate exploration agreements on their previous licences. Prior to this time, 7.1 million acres (2.9 million ha) were held under provincial petroleum exploration licences. This area is identified in Figure 8.

Staff prepared regulations for the Petroleum Resources Act and forwarded to industry for comment prior to finalization. Discussions were held between the Section and several exploration companies interested in carrying out future exploration work under the regime of the new Act. Staff of the Section compiled data on all petroleum boreholes drilled onshore Nova Scotia since the first recorded well was drilled in 1869 and a report was initiated to make this information available to interested parties.

LEGISLATION (OFFSHORE AND ONSHORE REGIONS)

The Nova Scotia legislation enacted during the 1984-85 fiscal year comprises three offshore and four onshore acts. The three offshore acts established a new legal framework for exploration and development offshore and formally implemented provisions of the Canada-Nova Scotia Agreement signed in March 1982. The four onshore acts summarized the legislation framework under which exploration and development can occur onshore. The seven provincial statutes and mirror federal legislation for the offshore, are summarized in the following table.

TABLE 8. Legislation Affecting the Offshore Activity

Nova Scotia		Canada
Onshore	Offshore	
	Canada-Nova Scotia Oil and Gas Agreement (Nova Scotia) Act	Canada-Nova Scotia Oil and Gas Agreement Act
Petroleum Resources Act	Offshore Oil and Gas Act	Canada Oil and Gas Act
Energy and Mineral Resources Conservation Act	Oil and Gas Production and Conservation (Nova Scotia) Act	Oil and Gas Production and Conservation Act
Pipeline Act		
Gas Utilities Act		

OTHER ACTIVITIES

Staff made six inspections of offshore drilling rigs and one inspection of an offshore vessel. Various geological working cross-sections, correlations, and lithologic strip logs were drafted, maintained, and updated. Several specific geological studies of significant discoveries in the offshore were undertaken.

A study of offshore petroleum development scenarios was completed summarizing the costs of different gas and oil production systems for various field sizes and offshore locations. The Section has begun an economic analysis of these different development scenarios, including their applicability to the Venture Project.

Staff compiled and updated a variety of summaries, maps, and tables on the offshore activity. These have been made available for internal and public use. Display materials were prepared and the Section participated in the 1984 Canadian Offshore Resources Exposition (CORE) and the 1984 Department of Mines and Energy Annual Open House. A number of presentations were given to public schools and educational institutions.

The Section continued to be active on a variety of committees:

- Canadian Petroleum Industry Training Society Course Examination and Certification Committee
- Environmental Co-ordinating Committee
- Sable Island Management Committee
- Sable Island Environmental Advisory Committee
- Venture Project Development Review Committee
- Petroleum Technology Training Advisory Board Committee.

In October of the fiscal year, the Section produced a publication entitled *Nova Scotia Oil and Gas Report 1984* which reviewed all offshore and onshore petroleum activities during the past year. The Section also provided assistance in the preparation of a Department publication *An Introduction to the Offshore*, which provides basic information on the offshore for use in the public school system.

Coal Section

C. E. Bain, P. Eng., Manager

INTRODUCTION

The Nova Scotia Department of Mines and Energy (NSDME) is responsible for the effective evaluation, promotion, and control of the development and use of Nova Scotia's coal resources for the optimum economic and social benefit of the Province. The first priority of coal development is to provide the coal needed to reduce Nova Scotia's dependence on imported oil for electrical generation and other energy requirements. Coal development must make optimum use of Nova Scotia's manpower, materials and equipment, and the people of Nova Scotia must obtain a proper share of coal revenue by way of royalty. Attractive returns to industry must exist as an incentive to explore and develop this resource.

The Coal Section, part of the Energy Resources Division of the NSDME is an integrated group with expertise in the fields of coal geology, utilization, and development. The primary objective of the Coal Section is to encourage and coordinate the development and efficient use of coal and peat. Its primary duty is the undertaking and coordination of applied research to aid and promote development of the Province's coal resource by expanding our knowledge of Nova Scotian coals, from their origin and geological character to their ultimate utilization.

The geological evaluation and understanding of the Province's coalfields and coal seams requires a multi-faceted approach. The Coal Section uses diamond-drilling as the primary source of data acquisition and evaluates the data using techniques such as geological mapping, structural interpretation, coal petrography and geophysical methods. The interpretation of depositional environments made possible by these methods is an important facet of the Coal Section's work because it permits the geologist to scientifically predict and understand the occurence, composition, and quality trends of Nova Scotia's coal resources.

These studies are necessary, not only to correlate coal seams and delineate coal basins, but also to understand Nova Scotia's coal resources to promote future exploration and development and advances in utilization research.

DEVELOPMENT AND UTILIZATION

Coal is one of the most important resources of the Province's mining industry, and the future of coal in the medium- to long-term will depend upon diversification of its utilization and the development of optimum mining,

handling, and transportation systems. The Coal Section monitors all research and development activity in the Province related to coal utilization to evaluate its applications to the Nova Scotian coal industry. The Section is involved with various facets of this activity, including coal liquefaction, fluidized-bed combustion, and coal-liquid mixtures.

An important function of the Coal Section is to identify problem areas and to direct research toward solving these. Coal transportation and markets, blending facilities, optimum use of existing infrastructure, cost-effective means of reducing combustion emissions, market competition with alternate fuels, and geological research into new exploration areas and existing mines are just a few of the problems facing the coal industry in the Province which the Department is addressing.

Coal-Related Research

The Coal Section continued its involvement through 1984 in the project to "Assess and Develop the Beneficiation Potential of Eastern Canadian Coals". This program is being carried out under the auspices of the Committee on Atlantic Coal with funds provided through the federal Department of Energy, Mines and Resources, Coal Utilization Program (Table 9). The main activity within this program during the past year was the effective completion of Phases 1, 2, and 3. Phase 4 was also completed during 1984 and Phase 5 began later in the year. Phases 6 and 7 were initiated by sending coal from the Prince mine to the EPRI Homer City Coal Preparation Pilot Plant in Pennsylvania. In addition, coals from the Prince mine, the Donkin-Morien development, and the Salmon Harbour seam in New Brunswick were sent to the new Devon Coal Preparation Pilot plant in Edmonton. Results of this extensive testing program were being collated at the end of 1984. During the coming year Phases 8, 9 and 10 of this program will be completed.

Committee on Atlantic Coal(CAC)

A Committee on Atlantic Coal was established in 1982 in response to a need to bring the scientific expertise in diverse institutions in the Atlantic Provinces to bear on specific problems related to the mining and utilization of coal. Another objective was to improve communications between the industry and those conducting research and development work.

The CAC has organized four technical working groups. These are: Coal Liquid Mixtures, Coal Benefication, Coal Pyrolysis, and the Coal Mining Working Group. Activities in coal related research and development work carried out by these working groups during 1984 are listed in Table 10.

TABLE 9. Beneficiation potential of Eastern Canadian coals — Project Phases

1. DATA BANK ON ATLANTIC COALS

— collect all existing data on chemical and physical characteristics.

2. DETERMINE ADDITIONAL PROPERTIES OF RAW COALS THAT WILL AFFECT BENEFICIATION

— review all coal R & D work currently being done in Atlantic Canada
— identify additional information required
— identify performers
— contract out specific projects to provide required additional information

3. SYNTHESIS OF ALL DATA FROM 1 & 2

— present available data from all major coal seams in similar format
— prepare all data for computerization
— run data for computer predictions of plant performance to determine the degree of upgrading possible by a variety of conventional washing techniques

4. IDENTIFY ALL EXISTING COAL PREPARATION OPERATIONS IN EASTERN CANADA

— present use
— optimum future use

5. ASSESS THE TECHNICAL, ECONOMIC AND SOCIAL BENEFITS OF UTILIZING BENEFICIATED COAL FOR THERMAL GENERATION

6. SELECT SPECIFIC EASTERN CANADIAN COALS FOR EXTENSIVE TESTING IN A PILOT PLANT PROGRAM

— select representative samples of coal based on 1, 2 & 3 above
— ship appropriate tonnages to pilot plant.

7. TEST SELECTED COALS IN A MULTI-CIRCUIT PILOT PLANT (HOMER CITY)

— detailed follow-up of results
— assess the potential of rejects utilization.

8. DETERMINE THE OPTIMUM BENEFICIATION TECHNIQUES FOR EASTERN CANADIAN COALS BASED ON PILOT PLANT TESTS

- technically: best results
- economically: least cost
- rejects utilization: best possibilities.

9. COMPLETE ECONOMIC ANALYSIS OF RESULTS

- determine optimum size of plants required
- locations
- capital and operating costs
- rejects utilization.

10. FINAL REPORT TO COMMITTEE ON ATLANTIC COAL

- evaluation of program
- recommendations for follow-up action.

TABLE 10. Committee on Atlantic Coal, Projects for 1984-85 Fiscal Year

Coal Beneficiation Working Group

Title of Study	Agency Responsible
Investigations of microbiological methods	Biology Dept. Dalhousie
Liberation of Pyritic Sulphur Upon Grinding	TUNS
Pore Size Distribution	TUNS
Preparation of Bacteria	TUNS
Investigations of Microbiological Methods in Problems Related to the Coal Industry	ACI
Desulphurization of Coal by Bacterial Leaching	ACI

TABLE 10. Continued

Title of Study	Agency Responsible
Coal Beneficiation Working Group	
Mineralogy of Sulphur-Bearing Minerals Relevant to Cleaning Processes	RPC
Effect of Ultrasonics in Oxydesulphurization	NSRF
Liberation of Pyrite in Prince Coal by Grinding in Closed Circuit with Classifier	TUNS
Mineralogy of Coal Slagging and Behaviour RPC	RPC
Adsorption Properties and Porosity Versus Wettability of Coals	TUNS
Coal Pyrolysis Working Group	
Sulphur Transfer During Pyrolysis	TUNS
Vacuum Pyrolysis of Coals, Pilot Scale	Univ. of Sherbrooke
Sulphur Capture in Fluidized Bed Pyrolysis with Limestone, Dolomite and Oil Shale	RPC
Coal/Lime Pyrolysis	NSRF
Coal Liquid Mixtures Working Group	
Corrosion by Carbogel	RPC
Development of an Integrated R&D Program for CLM including Survey of Hardware Required	RPC, TUNS, NSRF
Management of Round-Robin on Intercomparison of Particle Size Analysis and Viscosity in CLM	NSRFC, etc.

TABLE 10. Continued

Coal Beneficiation Working Group

Title of Study	Agency Responsible
Ceramics for Coal Utilization Resistant to Abrasion and Thermal Shock	NSRFC
Reactivity of Limestone related to use of CLM in Small Fluid Bed Reactors	TUNS
Flame Tunnel Burns of Fuels from Chemistry Division of NRC	CLM Tech.
Erosion Resista of Coatings of Plasma-Sprayed Alumina	TUNS
Treating NRC Burner at Tuft's Cove	CLM Tech.

Abbreviations:

TUNS — Technical University of Nova Scotia
RPC — New Brunswick Research and Productivity Council
NSRFC — Nova Scotia Research Foundation Corporation
ACI — Atlantic Coal Institute
CLM Tech. — Coal Liquid Mixture Technology

In November, a change in policy by the new federal government resulted in funding cut-backs to the National Research Council's coal budget. The impact on research and development in the energy field was considerable. In particular, funding for the Atlantic Research Laboratories (ARL) Coal Project was cut and the ARL Coordination Mandate in coal research was all but withdrawn. In light of these events the committee members felt that new sources of funding was necessary to carry on this important phase of research and development in coal related areas in the Maritime Provinces was necessary. The appropriate vehicle to support research and development in Atlantic Canada is under investigation.

Coal Liquefaction

In addition to its involvement in the Coal Beneficiation Program and activities under the auspices of the Committee on Atlantic Coal, the Coal Section also is involved with the Coal Liquefaction program at the Nova Scotia Research

Foundation Corporation (NSRFC). During 1984 the fifth phase of the experimental program on the direct hydro liquefaction of Nova Scotia coals was completed at NSRFC. This phase of the work concentrated primarily on single stage catalytic hydro generation and two stage thermal/catalytic liquefaction of Lingan Harbour seam coal.

Oil Substitution

Other coal-related research activity was supported under the Canada-Nova Scotia Oil Substitution Agreement. This activity included coal liquefaction, coal liqud fuels, and fluidized bed studies.

Coal Liquefaction. Coal liquefaction is a process by which solid coal is converted into a liquid fuel by increasing the hydrogen to carbon ratio under high temperatures and pressures.

Studies on Nova Scotia coals using both single-stage and two-stage process testing were carried on during the past year by the Scotia Coal Synfuels Consortium, funded in part by the Oil Substitution Agreement.

Coal Liquid Fuels (CLF). Three projects relating to coal liquid fuels were funded during the past year under the Canada-Nova Scotia Oil Substitution Agreement. These included:

1. Rheology and Spray Testing — This program, which is being conducted at NSRFC, began in 1985 and is an attempt to set up testing facilities by which the specifications of various coal liquid fuels may be determined and made compatible with the users needs and facilities. At present there are no such testing facilities for coal liquid fuels in Canada.

2. Testing of Combustion Nozzles — This project was conducted at the Centre for Energy Studies as an experiment to test a second generation nozzle using both heavy fuel oil and coal liquid fuel.

3. Determination of Optimum Ash — This study is currently being conducted at the Centre for Energy Studies. The purpose is to determine the corrosion and erosion effects of coal liquid fuels with various ash levels on boiler tubes and heater surfaces. It is hoped that this study will determine a coal liquid fuel with an acceptable ash level that may eventually be used in a utility boiler.

Atmospheric and Circulating Fluidized Bed. Two studies are presently being conducted by the Nova Scotia Power Corporation concerning the utilization of Nova Scotia coals in fluidized bed units. The first involves a series of ten, 1000-hour tests to determine the corrosion and erosion effects on heater tubes and surfaces in an atmospheric fluidized bed unit. The second is a feasibility study to determine if a circulating fluidized bed unit can be utilized for a 150 megawatt utility unit.

COAL GEOLOGY

In 1984, the Coal Geology group continued to collect, and evaluate geological data related to the Province's coal resources. This group also provided liaison with private companies actively engaged in mining and coal exploration within the Province. Locations of projects are shown on Figure 9.

The Cumberland and the St. Rose coal basins received attention with drilling, structural and sedimentological work being conducted in each area. Details of this work are given below.

Under the Canada-Nova Scotia Mineral Development Agreement, three projects were initiated. Under Federal projects, a computer data base of geological and analytical coal data will be established and a marine seismic survey off Port Hood and an onshore survey across the Cumberland coal basin will be undertaken. A provincial project will evaluate the oil shales within the Province. This follows preliminary sedimentology of the Pictou coalfield oil shales conducted by the Coal Section in the 1984 field season. Actual compilation and field work on these projects will begin in the 1985-86 fiscal year.

Cumberland Basin

Coal exploration studies conducted by the Coal Section within the Cumberland Basin were concentrated in the Salt Springs and Roslin coal districts (Fig. 9).

The investigation involved the diamond-drilling of four holes at Salt Springs and one in the Roslin coal district, and stratigraphic and sedimentologic mapping of the Riversdale and Cumberland Groups along Black River and its tributaries. In addition, a preliminary sedimentology study of the basal conglomerates of the Cumberland Group was undertaken to better understand the role that alluvial fans played in formation of coal within the basin.

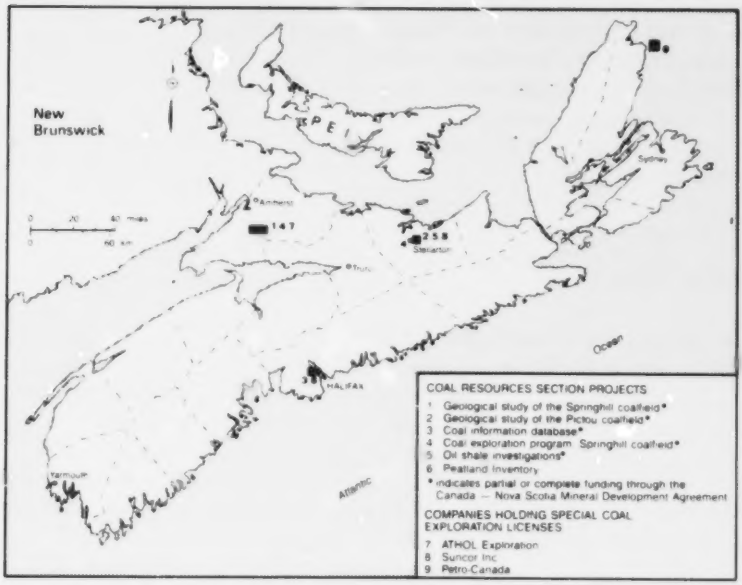


FIGURE 9. Location of Coal Section projects.

The coal-bearing strata at Salt Springs are estimated to be 1,837 feet (560 m) thick, as deduced through mapping.The lower most strata of the coal measures exposed on Black River are interpreted as poorly developed fluvial deposits with some lacustrine influence. A transition to major fluvial deposition with well-developed floodplain and coal swamp deposits occurs in an easterly direction as well as upward in the stratigraphic succession. The Sandrun seam, the major seam intersected, thickens within this lateral transition from two feet three inches (0.69 m) to six feet (1.80 m) over a plan distance of 4,100 feet (1 250 m).

At Roslin, north of Oxford, drillhole R-1 was completed to investigate thin, impure coal seams overlying and intercalated with the basal conglomerates of the Cumberland Group. These seams were identified by Coal Section mapping in 1980 and subsequently intersected in BP Canada drillhole OX-BP-9 in 1981. Further drilling is requried to ascertain depositional trends.

A more detailed discussion of these programs and the preliminary findings of the sedimentology of the basal Cumberland conglomerate appears in the **Mines and Minerals Branch Report of Activities 1984**.

St. Rose Drilling Project

In early 1984, a drilling program was proposed for the St. Rose Basin, Inverness County, to clarify the structural geology of the area. This program was undertaken to assist the Evans Coal Company who were in the process of upgrading their mining facilities.

A total of eight holes were drilled, one of which (SR-8) was drilled east of the mine area to determine whether a coal resource might exist beneath a proposed landfill site. The drilling totalled 4,482 feet (1 366m). The project was completed and the drill demobilized on September 13, 1984.

This program, combined with a thorough re-evaluation of data on the local geology resulted in:

1) a better definition of the nature and orientation of the St. Rose Fault Zone;

2) identification of a major fault (MacRae Fault) north of the Evans Coal Company mine which terminates the coal-bearing section; and

3) identification of a subparallel fault south of the mine which significantly displaces the coal-bearing section.

Remaining **in situ** reserves on the No. 5 seam have been calculated. Considerable information on the stratigraphic sequence and other previously defined coal seams has been compiled.

EXPLORATION ACTIVITIES

Two private companies held special licenses to explore for coal in 1984.

In the Pictou Coalfield, Suncor Inc. conducted a drilling program to investigate quantity and quality of several seams. Athol Exploration Limited took out leases on ground within the Cumberland Basin east of the Springhill coalfield with the intention of exploring for new coal areas, based upon depositional models proposed by the Coal Section.

Novacorp Engineering (formerly Noval Technologies) continued to monitor demethanation wells in the Pictou coalfield.

PEATLAND INVENTORY

Peat is an accepted alternate fuel for energy production in many countries around the world. For several decades, peat fuels have been utilized at all scales of energy production.

Nova Scotia has about 395,300 acres (160 000 ha) of peatland (about 4 per cent of the Province) distributed in five or six regions of the Province. (Fig. 10). The 1984 field program deposits throughout Cape Breton Island as well as some additional deposits in Yarmouth and Shelburne Counties of southwestern Nova Scotia.

Cape Breton Island

The deposits evaluated in Cape Breton and Richmond counties contain approximately 111 million cubic yards (85 million m) of peat of which about 25 per cent is classed as fuel grade. Data from the 36 deposits surveyed also show large amounts of good quality moss grade peat that could be developed for horticultural use.

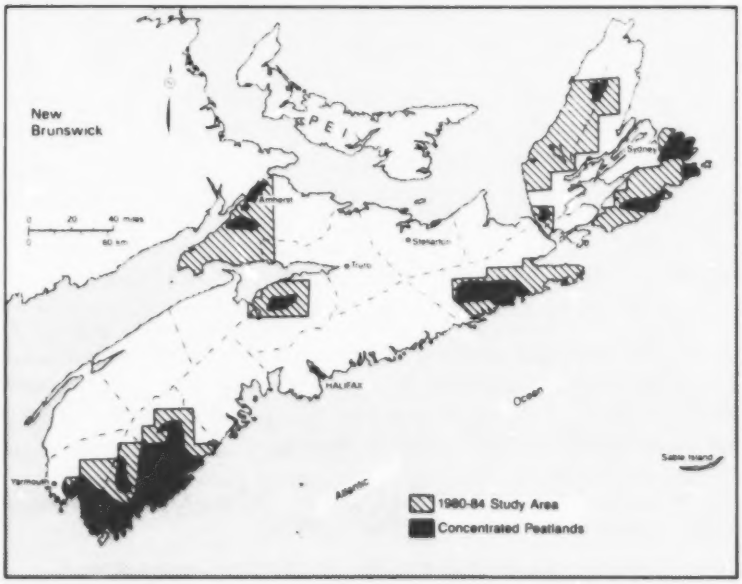


FIGURE 10. Regions of peatland concentrations in Nova Scotia.

In Victoria and Inverness counties of western Cape Breton 4,300 acres (1740 ha) of peatlands were identified, representing approximately 35.3 million cubic yards (27 million m) of peat, of which 24 per cent is classed as fuel grade. With few exceptions the peat resources in this region consist of moss grade peat.

A peat deposit in the Lake Ainslie (Black River) area has been recommended as an ecological preserve because of its unique vegetation and stratigraphy.

Cape Breton Island is estimated to have a total resource of approximately 752 million cubic yards (575 million m^3) of peat in approximately 62,659 acres (25 358 ha) of peat-land. Moss grade peat is estimated to represent 75 per cent of the peat in this region.

Southwestern Nova Scotia

Additional deposits in Yarmouth and Shelburne counties were surveyed to complement work done in earlier field seasons. The survey covered 2,841 acres (1 150 ha) of peatlands revealing an additional 31 million cubic yards (24 million m) of peat of which 56 per cent is classed as fuel grade.

Other Activities

A joint project sponsored by the Nova Scotia Department of Mines and Energy and the Nova Scotia Land Survey Institute continued during 1984 to assess the potential of using LANDSAT imagery and a computerized image analysis system for mapping peatlands in southwestern Nova Scotia.

Methodology developed by this project was to allow computerized mapping of peat deposits across the Province. However, all attempts to develop a useable methodology were not successful, and as a result regional mapping is being pursued via direct interpretation of 1:63 360 color IR photography. The final product will be a series of 1:250 000 peatland maps depicting regional information on the extent and types of peatlands in the Province.

Summary

To date the Inventory Program has covered a total of 81,800 acres (33 100 ha) of peatlands on main-land Nova Scotia. The volumes associated with this total area are: 617 million cubic yards (472 million m) moss grade peat and 420 million cubic yards (321 million m) fuel grade peat. These volumes equate to 76 and 67 million tons (69 and 61 million t) respectively.

Extrapolation of these data provides estimates of total resource in the studied regions of 224 million tons (204 million t) of moss grade peat and 166 million tons (151 million t) fuel grade peat to date.

The collection of peatland inventory field data is now complete, and efforts are now directed towards the production of a final report to be available in early 1986.

ENERGY MANAGEMENT DIVISION

C. Ryan, P.Eng., Director

The Energy Management Division has four primary responsibilities:

1. the evaluation and analysis of policies and technologies affecting energy supply and demand,
2. the co-ordination of energy planning and of provincial submissions to energy regulatory agencies,
3. the provision of energy management and conservation programs, fuel substitution programs, and renewable and indigenous energy resource programs, and
4. the provision of programs that increase public awareness of energy conservation, energy supply options, provincial energy policies, plans and programs.

These responsibilities are met through the activities of three sections: Economics and Statistics — providing energy planning, policy evaluation, statistical analysis, and regulatory submissions; Energy Engineering — carrying out technical analyses and delivery of energy management, fuel substitution, and renewable energy programs primarily to the business and public sectors; and Public Programs — providing and co-ordinating information transfer activities and delivery of programs to the residential sector.

Impending development of offshore energy resources was responsible for a substantial amount of energy planning and analysis activity in the 1984-85 fiscal year .

The Economics and Statistics Section responded to numerous requests for information on such issues as gas pricing policies and regulatory procedures of the United States, Maritime gas markets, National Energy Board rulings and procedures, and gas transmission and distribution system costs.

Staff of all sections worked extensively in fiscal year 1984-85 on an update of the Province's Energy Plan. The groundwork for an evaluation of the Province's first Energy Plan was completed in 1979 and recommendations for future policies and initiatives were prepared.

A five volume report, *Comprehensive Study of Energy Consumption in the Province of Nova Scotia,* was completed. This report offers a detailed examination of energy demand in Nova Scotia. Computer models for use in forecasting future demand were developed and will be used in preparing the Energy Plan Update.

Two federal/provincial agreements, the Canada-Nova Scotia Subsidiary Agreement on Energy Conservation and the Canada-Nova Scotia Agreement on Industrial Energy Conservation expired on March 31, 1984. The period to March 31, 1985, was designated for completion of commitments made prior to the expiry of the agreements. These cost-shared agreements included Pilot Projects Program, Small Business Energy Analysis Program, Cogeneration and Waste Heat Utilization Program, Energy Test and Information Centre (ENERTIC), and Ener$ave.

The Division responded by developing new programs to commence April 1, 1985, to fill the void left by the end of federal-provincial initiatives. The new Provincial Energy Analysis Program provides energy analyses and follow-up services to businesses with annual energy bills of less than $10,000 as well as to all municipal and provincial government operations.

The grant element of the Small Business Energy Analysis and Grant Program was terminated for fiscal year 1984-85 and the program renamed Small Business Energy Analysis Program. More than 300 energy analyses were performed and 142 grant payments committed prior to March 31, 1984, and worth $407,000 were processed. The Ener$ave Program performed 318 energy audits in the 1984-85 fiscal year on industries, businesses, and institutions whose energy bills totalled $6.76 million annually.

The Pilot Projects Program provided financial assistance totalling $4.5 million to 83 projects during its six years of operation.

In the residential sector, the Division continued to receive and respond to public demand for advice, information, and publications relating to all aspects of residential energy conservation and fuel substitution. Several new publications and audio-visual programs were produced and a highly successful publication for students called *An Introduction to the Offshore* was distributed.

The Division monitors and provides statistical information on energy supply and demand on a continuing basis and produces an annual report on the topic. Primary energy consumption in Nova Scotia increased marginally by 0.2 per cent during the 1984 calendar year to 220.4 trillion Btus. This follows a decline of 1.9 per cent in 1983. (Primary energy use is defined as the total energy input into the economy and includes petroleum, coal, hydro electricity, and natural gas.)

Sales of refined petroleum products dropped 1.5 per cent in 1984 following a 7.1 per cent decline in 1983. The 23.7 million barrel (3.77 million m) total for 1984 is down from 33.4 million barrels (5.3 million m) in 1978. Petroleum

accounted for 66.9 per cent of primary energy consumption in 1984, down from 68 per cent in 1983. This reflects the success of the Province's oil substitution and energy conservation programs.

Economics and Statistics Section

V. Harnish, Manager

INTRODUCTION

The Economics and Statistics Section evaluates and analyses issues arising from energy developments and policies of a provincial, national, and international nature and recommends appropriate responses. The Section also administers a comprehensive energy planning program and is responsible for statistical reporting of energy supply and demand in Nova Scotia.

The Section prepares reports, position papers, publications, and computer models and manages the preparation of studies by private consultants. Depending on the nature of the material, these studies are made available to other ministries, the public, energy corporations, and other governments and agencies. The Section also prepares and co-ordinates submissions on behalf of the Province to regulatory authorities such as the National Energy Board.

ACTIVITIES

A major project embarked upon by the section during the 1984-85 fiscal year was an update of the 1979 Nova Scotia Energy Plan. Duties included the compilation of a number of background sections for the document, analyses of the economic feasibility of several potential energy supply options, demand forecasting, and overall coordination of the project.

In conjunction with the updating of the Energy Plan, a comprehensive and detailed examination of energy demand in Nova Scotia was undertaken utilizing econometric modelling and sampling techniques. The models constructed, among the most sophisticated of this nature ever developed in Canada, will be relied upon to forecast the Province's energy requirements and assess the supply side initiatives and projects.

The impending development of the Province's offshore energy resources remained as a highlight of the Section's work. Emphasis shifted somewhat towards upcoming procedural matters such as preparing potential regulatory interventions, analysing competing proposals and signing the producers' export contracts.

The examination of energy supply and demand in the northeastern United States was completed. It concluded that a substantial market for offshore natural gas will exist in a time frame commensurate with that of the producers' most recent development and production plans.

Other topics included an economic evaluation of a number of conservation programs undertaken by the Department over the past five years and an updating of the minister's background material for the 1985 legislative session. The Section also participated in emergency energy planning through the Interprovincial Advisory Committee on Energy and Northeast International Committee on Energy.

In addition, the Section is committed to keeping the Department current on energy statistics and trends. An energy fact sheet containing data on supply, demand, and pricing of coal, electricity, and petroleum products is produced at regular intervals. Each year, an Energy Statistical Profile of the Province is published. The Section also obtains, prepares, and operates various computer models, including those used to determine pipeline tariffs and natural gas prices.

The Section continues to administer the Electric Power Rate Subsidy Program, explain program changes, and prepare rate books for local utilities. Rates are analysed for decision makers on a continuing basis. The Energy Planning Project under the Canada-Nova Scotia Subsidiary Agreement on Energy Conservation is administered by the Section. The Section is also a participant in a Load Management Program, funded under this Agreement, in which the Nova Scotia Power Corporation is gathering load control data on various forms of indirect load management such as marginal cost-based, time-differentiated pricing.

Engineering Section

INTRODUCTION

The Engineering Section is responsible for five major programs: Ener$ave, Pilot Projects Program, Cogeneration and Waste Heat Utilization Program, Energy Test and Information Centre (ENERTIC) Program, and the Small Business Energy Analysis Program. All five programs are funded under cost-shared agreements between Nova Scotia and Canada. The Section also does technical studies and monitors technological developments in the fields of energy management and renewable energy resources. The goal of all programs and activities of the Section is the reduction of provincial energy use, particularly of petroleum products, and the increase in the efficiency of energy use.

ACTIVITIES

Ener$ave Program

On June 3, 1982, the Canada-Nova Scotia Agreement on Industrial Energy Conservation was signed. This Agreement replaced the former Ener$ave Agreement and had provided for the continuation of the Ener$ave Program and the Consultant Follow-up Program to March 31, 1984. This Agreement was not renewed and in accordance with the Agreement the program went into the termination phase. This phase allowed only for the honouring of program commitments as of March 31, 1984, in the energy analysis and the consultant follow-up elements.

The Ener$ave Program honoured all commitments made prior to April 1, 1984. From this date to March 31, 1985, 318 energy audits were completed on establishments with combined annual energy bills of $6,758,000. Potential annual energy savings of $1,240,000, representing 18 per cent of energy use were identified. A summary is provided in Table 11.

TABLE 11. ENER$AVE PROGRAM (1984-1985 Fiscal Year)

	Industrial	Commercial	Institutional	Total
Number of Audits	9	87	222	318
Total Energy Cost	$261,900	$2,381,500	$4,114,500	$6,757,900
Average Per Site	$ 29,100	$ 27,374	$ 18,434	$ 21,252
Potential Savings Value	$ 77,860	$ 428,630	$ 733,870	$1,240,360
Percentage Savings	29.7%	18%	17.8%	18.4%

The Ener$ave Program was active in Nova Scotia between 1977 and 1985, and during this time completed 2,312 audits for an identified annual energy savings of $22,620,200. The Consultant Follow-up element paid $2,720,230 to 478 clients for energy conservation related technical studies.

In 1984, a follow-up study termed "Enerfect" was conducted to determine the overall effectiveness of the Ener$ave Program. Energy savings at 459 sites audited by Ener$ave were assessed. It was found that the sites achieved an average energy saving of 11.35 per cent.

Pilot Projects Program

This program encouraged the development, demonstration, and use of new energy conservation technologies and renewable energy sources. The program provided financial and technical assistance for demonstration projects using innovative energy conservation and management technologies, and those using any of the renewable energy sources. Financial participation by individuals or companies proposing the project was required. The amount of assistance varied with the financial risk involved. The program's objective was to introduce new energy technologies in Nova Scotia, thereby broadening the range of energy sources used in the Province.

The program was in a clean-up stage during the fiscal year 1984-85. Funds could not be committed to new projects, however, expenditures could be made for information transfer activities such as seminars and publications. Previous commitments were honoured as projects were completed.

Over its six-year life, 98 formal proposals were received with 83 projects receiving a total of $4.5 million in assistance. This includes 303 small scale projects which received $1.38 million in assistance.

Of all the technologies demonstrated under the program, conservation and biomass hold the most promise for the Province. Conservation is certainly not new but an enormous potential for further savings remains; this was made evident in the hospitals, schools, and recreation facilities projects. With technical advances in combustion and handling equipment, biomass has become a viable energy option for industry. The highly successful Bruks combustion system installed at Avon Valley Greenhouses has generated a great deal of interest.

During the life of the program, over 105,000 copies of 61 different summary sheets describing many of the projects were distributed. In addition, many of the early small scale projects were publicized in the book, *Renewable Energy Projects in Nova Scotia.*

Section staff are continuing to promote biomass and conservation as well as seeking new opportunities for departmental involvement utilizing funds from other federal or federal/provincial programs.

Small Business Energy Analysis Program

This Program's Agreement with the federal government was not renewed and, as of March 31, 1984, the grant element was terminated with the exceptions of honouring commitments already made. The analysis element was allowed to continue until March 31, 1985, and for this period the program's name was changed to the "Small Business Energy Analysis Program".

During the period April 1, 1984 to March 31, 1985, 308 site analyses were completed and 142 grant payments totalling $407,000 committed prior to March 31, 1984, were honoured. The program summary appears in Table 12.

The Small Business Energy Analysis Program was active between September 1, 1983, to March 31, 1985. During this period 630 site analyses were completed. The Program analysed $3,068,500 of combined annual energy bills and suggested changes with a potential energy savings of $1,018,400, representing 33.2 per cent of the value of energy used.

TABLE 12. SMALL BUSINESS ANALYSIS PROGRAM (1984-1985 Fiscal Year)

	Industrial	Commercial	Institutional	Totals
Number of Audits	23	244	41	308
Total Energy Cost	$134,832	$1,489,080	$189,485	$1,813,397
Average Per Site	$ 5,862	$ 6,102	$ 4,621	$ 5,880
Potential Savings Value	$ 47,551	$ 470,311	$ 63,705	$ 581,567
Percentage Savings	35.3%	31.6%	33.6%	32.1%

Cogeneration and Waste Heat Utilization Program

The goals of this program were to search out the potential opportunities for these energy technologies and to illustrate the value of these technologies to industry,

institutions, and commercial sites. The goals of the Program were accomplished by means of demonstration projects, seminars, and project evaluation study grants.

With 1984-85 being the clean-up year, activities focused on completing those contracts and projects that were put in place by March 31, 1984. Emphasis centred on the demonstrations and project evaluations to which funds were already committed.

Waste heat recovery demonstration projects at Farmers Co-operative Dairies Ltd. and Hostess Food Products Limited were in operation. The waste heat recovery project evaluation study grant program proved to be a success. At the time of program termination about 40 sites had received funding for studies. Approximately $530,000 was spent under this program to March 31, 1985.

Energy Test and Information Centre (ENERTIC)

The Energy Test and Information Centre consisted of support for two distinct operations: a solid fuel testing facility at the Technical University of Nova Scotia and an energy information resource centre at the Nova Scotia Research Foundation Corporation.

The information centre provided energy-related information to both the public and private sectors.

This service also encouraged the development of technical innovation by carrying out preliminary evaluations of ideas and inventions. During the fiscal year 1984-85, 217 inquiries were handled by the information centre and 301 documents were added to the database. Enertic provided capital assistance for equipment to evaluate for efficiency and output of solid fuel combustion units. In addition, a number of combustion research and development contracts requiring use of the flame tunnel facility supported in part by Enertic were completed for industry and government.

Other Activities

The Engineering Section was involved in several other activities during the fiscal year. Staff performed inspections on 297 solar and three wind energy equipment projects on behalf of the Provincial Tax Commission under the sales tax rebate program. Labour and material costs of these projects was approximately $1.36 million and $82,722 in provincial sales tax rebates was returned.

Staff were involved in a number of seminars in fiscal year 1984-85. Pilot Projects Program staff arranged seminars on energy efficient new housing, industrial wood heating, and energy conservation in schools and hospitals, among others. These seminars were well attended. In addition, staff made numerous presentations to various groups on programs and projects assisted and undertaken by the Section. Staff participated in a number of sections of the Energy Plan Update and were involved in monitoring technical developments affecting the efficiency of energy utilization and providing technical input to interdisciplinary studies.

Public Programs Section

J. Gordon, Manager

INTRODUCTION

The Public Programs Section is responsible for encouraging the more efficient use of energy and fuel substitution, primarily at the residential level. It does this by providing factual and motivational programs and information on energy. The Section also serves the public information needs of the Division by coordinating the production of technical and promotional printed material, audio/visuals, and advertising.

Public Programs is also responsible for monitoring and addressing significant residential energy conservation issues as well as assessing and surveying public attitudes towards energy.

A variety of educational and outreach programs are implemented by the Section, often in co-operation with other departments, groups, or associations. Activities are funded directly by the Nova Scotia Department of Mines and Energy as well as jointly under the Public Information Project of the Canada-Nova Scotia Subsidiary Agreement on Energy Conservation.

ACTIVITIES

Each year the Section receives thousands of requests from the public for advice and information. Requests are made in one of several ways. The Enerinfo phone line (1-424-5727), a province-wide, toll free advisory service, accounts for the majority of information requests. Written requests, referrals from other agencies, and response to Section advertising and promotional material account for the remainder. Information provided ranges from the very general to extremely specific, and covers such topics as heating systems, air sealing, new home

construction, and vehicle fuel economy. In addition, a large and growing volume of educational requests for resource materials on energy matters are addressed during the year.

The Section also participates in major energy related trade shows each year. The Enerinfo display used at these events is heavily patronized, numerous questions are answered by staff, and thousands of publications are distributed. In addition, staff give seminars to smaller groups on topics such as wood heating, air sealing, insulation, condensation, and heating system upgrading. Staff also respond to requests for site inspections of homes with major problems. Eighty-one inspections, followed by recommendations, occurred in this fiscal year.

Publications and posters are distributed to Nova Scotians and audio/visual material is made available on a loan basis. In addition to previously published material, the Section produced and distributed new publications dealing with home heating systems, condensation, air sealing, and energy programs in the past year. Section staff also cooperated in the production and design of publications for other sections, including the *1984 Energy Statistical Profile* and *Nova Scotia Oil and Gas Report 1984*.

New publications in the fiscal year 1984-85 included *Energy Publications Guide* and *Controlling Condensation in the Home*. New audio/visual productions included slide/tape presentations on housing retrofit, school energy conservation, and hospital conservation. These audio visual productions were completed in co-operation with the Engineering Section.

Energy Awards

Nova Scotia Energy Awards is an annual program that features presentation of awards by the Minister of Mines and Energy for outstanding contributions to energy management or fuel substitution. The following is a list of 1984 Nova Scotia Energy Award winners.

Category 1, Large Manufacturing

Esso Petroleum Canada, Dartmouth Refinery, Dartmouth

- Reduced energy consumption more than 19 per cent per unit of output.

Category 2, Business, Commerce, and Non-government

Foodmaster, Bridgewater

- Reduced energy for space heating by nearly 50 per cent from previous year.

Category 3, Governments

All Saints Hospital, Springhill

- A significant reduction in energy consumption achieved through load shedding, improved operating procedures, preventive maintenance programs, and staff involvement.

Category 4, Organizations and Community Groups

Solar Nova Scotia, Dartmouth

- This volunteer organization developed, promoted, and delivered a comprehensive solar greenhouse design and construction course to interested Nova Scotians. It has been offered in areas from Yarmouth to Sydney and has more than 300 graduates.

Category 5, Energy Innovation

Sackville Arena, Lower Sackville

- Reduced electrical costs by 14 per cent by controlling demand and recovering heat from their refrigeration equipment.

Category 6, Individual

Mr. Ross Bunnell, New Germany

- Mr. Bunnell promotes alternate energy in Nova Scotia, in particular, wind power. His interest evolved into a full-time occupation and the formation of his own company, Alternate Energy Services. His company is involved in independent and grid-connected wind systems, independent hydro, gas/diesel, and photovoltaic systems.

Committee Memberships

Staff represented the Department on numerous committees, including the Ureaformaldehyde Task Force, the Maritime Energy Education Coordinating Committee of the Maritime Provinces Education Foundation, the Canadian General Standards Board (Standards for Insulation Contractors), and the Energy Technical Committee of the Roads and Transportation Association of Canada.

Promotional Services

The staff of the Section provided comprehensive information, printing, and advertising services to the Division. This took the form of about 30 press releases on Division activities, seminar promotion through brochures and advertising, numerous printing requisitions, and advertising for programs such as Enersave and Small Business Energy Analysis Program. The Section also coordinated extensive advertising and promotional campaigns under the Canada-Nova Scotia Subsidiary Energy Agreement on Energy Conservation.

Program Initiatives

Several major program initiatives were mounted by the Section in the fiscal year 1984-85 under the Canada-Nova Scotia Subsidiary Agreement on Energy Conservation. Capital assistance was offered automotive service operations in acquiring emission analysis and carburetor adjustment equipment to improve fuel economy. Eight service outlets in Nova Scotia participated in the program.

A major survey of public attitudes towards energy conservation and related issues was conducted in May 1984. It included a survey of response to advertisements produced under the Subsidiary Agreement.

The Section has developed a highly successful Energy Education Program in Nova Scotia public schools. In fiscal year 1984-85 the program made presentations to nearly 33,000 students in 170 schools throughout the Province. This is a 27 per cent increase in audience over the previous fiscal year.

During the summer of 1984, staff developed *An Introduction to the Offshore* — a publication especially for junior high and senior high students and teachers. This highly successful booklet was reprinted twice later in the year.

ADMINISTRATION DIVISION

C.R. James, C.M.A., Director

The Administration Division provides the Department with financial, operational, and personnel management. It also provides cartographic and administrative services to the Department and accounting services for Novaco Limited. The Director is Secretary-Treasurer of this crown corporation.

Under the Departmental Budgetary System, the Administration Division consists of the Offices of the Minister and Deputy Minister, Energy Branch Administration, Mines and Minerals Branch Administration, and the Administration Division.

The duties and functions of the Division are divided among four sections: Accounting Services, Mineral Taxation and Fiscal Planning, Personnel and Administration, and Cartography.

The Administration Division is responsible for mineral and petroleum resource revenue policy, the collection of mineral royalties and taxes, and the management and evaluation of government funded coal mine and coal miner assistance programs.

During the year, the coal miners Pre-Retirement Leave Plan was changed from standby pay to a pension. Administration of this program and the Dosco (1923) Pension, paid by the Province, was transferred from Novaco to the Department of Mines and Energy.

Numbering and coding changes made in the furniture and equipment inventory system will improve control and facilitate planned introduction of automated records. Several enhancements were made to Management Information accounting reports. Work is proceeding toward the development and implementation of an approved system of Records Management.

Accounting Services Section

Ken Faulkner, C.M.A., Manager

The Accounting Services Section provides managerial and financial accounting and performs statistical services for the Department.

The Section is responsible for maintaining and updating the computerized departmental accounting system which provides internal control by recording, reporting, and reconciling expenditures with Department of Finance

information. In the course of this year, enhancements were introduced to the computerized program. This makes it possible to produce summarized Cost Centre reports for the Minister and Deputy Minister, which indicate monthly and year-to-date department expenditures, the annual budget, and the percentage of budget used. This report had been previously prepared manually.

During the year responsibility for the administration of the Coal Miners' Pre-Retirement Leave Program and the DOSCO 1923 Pension Program, as well as the responsibility for co-ordinating the Department Budget Process, were transferred to this Section.

The Coal Miners' Pre-Retirement Leave Program is designed to alleviate the hardships of employees who are required to leave the mine work force due to a cutback in production or mine closure. There are approximately 52 recipientsreceiving pensions and 90 receiving Pre-Retirement Benefits for a total expenditure of more than $454,000.

Mineral Taxation and Fiscal Planning Section

Blair McMullin, Manager

The Mineral Taxation and Fiscal Planning Section is responsible for resource revenue policy and administration of mineral royalty and tax legislation, and the Coal Mine Financial Assistance Program. The Section also provided accounting services for Novaco Limited, a provincial crown corporation.

Mineral Royalties and Taxes

This Section proposes legislative amendments and manages the royalty and tax provisions of the Mineral Resources and Gypsum Mining Income Tax Acts.

The revenue from royalties and taxes reported by the Department are shown for a 20 year period in Figure 11 and for the current fiscal year in Table 13.

Coal Mines Financial Assistance Program

The Independent Coal Mines Subsidy program is administered by the Section. The program has been in operation since 1968 providing financial assistance to the participating coal mine operations for a measure of economic stability to communities heavily dependent upon the continuance of the industry.

TABLE 13. Royalties and taxes for the fiscal year ended March 31, 1985.

Commodity	Royalty or Tax
Gypsum	$ 787,562
Coal	774,377
Salt	168,340
Other	53,468
Total	$1,783,747

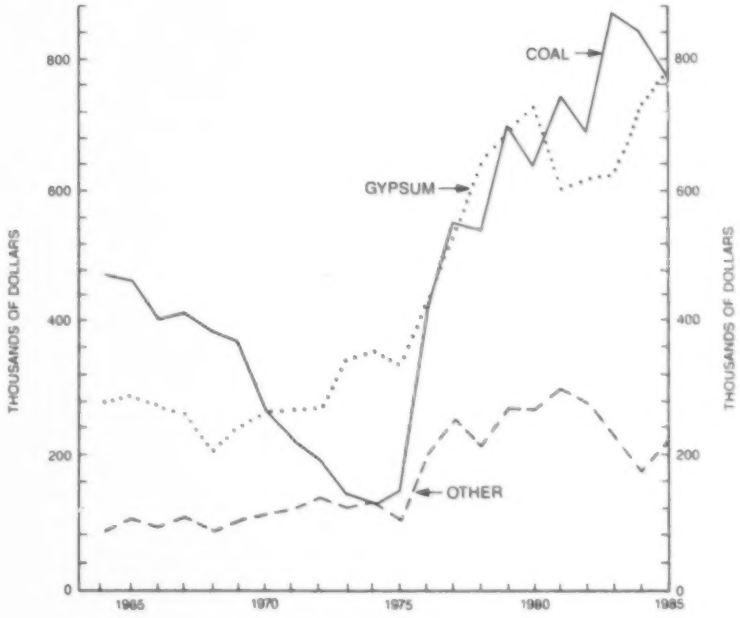


FIGURE 11. Historical review of royalties and taxes.

During the year, subsidies in excess of $500,000 were granted to the two remaining coal operations participating in the plan: Evans Coal Mines of Inverness and Pioneer Coal Limited of Westville (formerly the Drummond Mine). Pioneer Coal experienced a fire in its underground operations in August 1984. The mine officially closed as of December 31, 1984. The company's surface mining operation does not receive any financial assistance under this Plan.

During the year the Coal Miners' Pre-Retirement Leave Program, previously administered by Novaco Limited, became a pension program and a responsibility of the Department administered by the Accounting Section.

Personnel and Administration Section

P. Edwards, Manager

This Section provides advice and support on personnel management to all divisions of the Department. The responsibilities of the Section include staffing programs, labour-management issues, establishment and maintenance of performance appraisal systems, career development training, personnel and payroll documentation, and the maintenance of employee records. The Section is also responsible for the continual upgrading of office and administrative services for the Department.

In co-operation with the Provincial Records Manager, work is proceeding towards the establishment of a system of Records Management in compliance with the Public Records Disposal Act.

The coding and recoding of furniture and equipment introduced last year have improved inventory control and will form the basis for an automated system which is expected to be implemented within the next year.

During the year the Section provided support in recruiting a number of staff to work on programs related to the new five-year Canada-Nova Scotia Mineral Development Agreement.

Throughout the year staff attended various inservices and external courses, and programs covering areas such as management and supervisory development, communication skills, clerical/secretarial development, and occupational health and safety.

With the announcement of a Provincial Winter Employment Program approximately 25 people were hired during the winter months. Our university

student recruitment program also provided summer employment for approximately 50 students.

The personnel changes during the 1984-85 fiscal year are shown in Table 14.

TABLE 14. Personnel changes during the 1984/85 fiscal year

Appointments	Resignations
Byron Rafuse	Jay Pirooz
Patrick McMahon	Vaughn Munroe
Brian MacInnis	James MacDonald
Andrew Batcup	Beverly Simmons
Catherine Delano	Jamie Chipman
Donna Elchuck	Geoffrey Braybrooke
Paul McCulloch	Peter Healy
Chris Kavanaugh	Peter Melnyk
	Bruce MacNeil

Retirements

Arthur Findlay

Cartographic Service Section

D.H. Bernasconi, Section Manager

The major responsibility of the Cartographic Section is to provide drafting and photographic services for all the divisions of the Department. Most of the material produced is related to geological studies and energy programs for inclusion in various publications.

This component also produces approximately 300 mining claim maps for plotting areas held under the Mineral Resources Act and the Petroleum and Natural Gas Act.

The photographic unit reproduces material for publication purposes, provides photography assignments, furnishes slides for audio visual presentations and is constantly expanding and cataloguing a comprehensive collection of 35mm coloured transparencies related to the mining and energy resources of the Province.

FINANCIAL INFORMATION

The Department of Mines and Energy had 153 people on staff as of March 31, 1985. During the 1984-85 fiscal year, the Department administered expenditures of $48,482,000 while recovering $2,328,547 from various funds. Royalties and mining taxes as reported in Table 15 were $1,783,747, and the licences and fees were $358,604 for total revenue of $2,142,351.

Expenditure information is presented in Table 15 under three headings. OPERATIONS and ASSISTANCE are budgeted in the Department. OTHER includes expenditures budgeted under a Public Service Vote and in the Department of Development.

OPERATIONS information is presented by budget subject title by division.

ASSISTANCE information is presented by budget subject title under two sectors: Coal Industry and Energy.

OTHER is presented by the legislative vote title or the department where the funds have been budgeted.

As the expenditure information provided was drawn from the publications *Estimates of the Government of Nova Scotia* and *Public Accounts of the Province of Nova Scotia*, the subject titles may differ from the sectional titles drawn from the Department Organization Chart.

TABLE 15. Financial information about the Department of Mines and Energy

Division Activity Budget Subject Title	Actual Expenditure 1983-84	Estimate 1984-85	Actual Expenditure 1984-85
OPERATIONS			
ADMINISTRATION DIVISION			
1. Office of the Minister and Deputy Minister	$ 308,808	$ 493,000	$ 389,383
2. Accounting, Personnel and Administration	255,117	302,500	302,653
3. Clerical Support Services	320,335	381,800	371,657

TABLE 15. Continued

Division Activity Budget Subject Title	Actual Expenditure 1983-84	Estimate 1984-85	Actual Expenditure 1984-85
4. Cartographic Services	240,468	251,000	248,640
5. Energy Branch Administration	164,792	229,600	245,974
6. Mines and Minerals Branch Administration	284,989	274,500	290,467
TOTAL Administration Division	$1,574,509	$1,932,400	$1,848,774
ENERGY MANAGEMENT DIVISION			
1. Energy Statistics	$ 39,929	$ 51,800	$ 47,296
2. Enersave Program	1,045,899	927,900	1,258,340
3. Energy Planning	141,558	701,700	185,087
4. Public Programs and Promotion	96,405	242,600	198,173
5. Energy Engineering	106,379	132,800	85,265
6. Energy Publications	13,808	47,600	16,160
TOTAL Energy Management Division	$1,543,978	$2,104,400	$1,790,321
ENERGY RESOURCES DIVISION			
1. Petroleum Resources	$ 484,703	$ 451,800	$ 379,076
2. Coal Exploration	224,277	301,200	268,637
3. Peatlands Inventory	112,454	129,400	118,563
4. Coal Development and Utilization	95,991	142,700	85,749
TOTAL Energy Resources Division	$ 917,425	$1,025,100	$ 852,025
DRILL AND MECHANICAL DIVISION			
1. Drilling Services	$ 450,277	$ 412,500	$ 440,773
2. Support Services	260,300	282,200	274,816
TOTAL Drill and Mechanical Division	$ 710,577	$ 694,700	$ 715,589

TABLE 15. Continued

Division Activity Budget Subject Title	Actual Expenditure 1983-84	Estimate 1984-85	Actual Expenditure 1984-85
MINING ENGINEERING DIVISION			
1. Mining Engineering	$ 116,706	$ 193,400	$ 175,933
2. Mine Safety and Inspection	401,434	462,100	437,205
TOTAL Mining Engineering Division	$ 518,140	$ 655,500	$ 613,138
MINERAL RESOURCES DIVISION			
1. Mineral Resource Evaluations	$ 89,899	$ 207,000	$ 202,719
2. Regional Surveys	250,196	275,600	279,459
TOTAL Mineral Resources Division	$ 340,095	$ 482,600	$ 482,178
MINERAL DEVELOPMENT DIVISION			
1. Mineral Development	$ 175,497	$ 220,900	$ 207,865
2. Exploration Monitoring	166,701	219,800	190,012
3. Library Services	192,172	137,000	133,459
TOTAL Mineral Development Division	$ 534,370	$ 577,700	$ 531,336
TOTAL OPERATIONS	$6,139,094	$7,472,400	$6,833,361
ASSISTANCE PROGRAMS			
COAL INDUSTRY ASSISTANCE			
1. Coal Miners' Assistance	$ 473,814	$ 510,000	$ 472,926
2. Coal Development — Novaco	60,000	75,000	75,000
3. Coal Mines Subsidy	954,842	685,000	571,119
4. Coal Reclamation Project	147,026	80,000	39,463
TOTAL Coal Industry Assistance	$1,635,682	$1,350,000	$1,158,508

TABLE 15. Continued

Division Activity Budget Subject Title	Actual Expenditure 1983-84	Estimate 1984-85	Actual Expenditure 1984-85
ENERGY ASSISTANCE			
1. Coal Liquefaction	$ 232,177	$ 246,000	$ 245,902
2. Oil Substitution	779,896	2,022,600	1,091,089
TOTAL Energy Assistance	$1,012,073	$2,268,600	$1,336,991
TOTAL ASSISTANCE	$2,647,755	$3,618,600	$2,495,499
OTHER PROGRAMS			
OTHER			
1. Power Rate Assistance Budgeted as a Public Service Vote	$36,470,403	$36,220,000	$35,641,488
2. Energy and Mineral Subsidiary Agreements Budgeted in Department of Development	3,584,993	4,927,200	3,619,066
TOTAL OTHER	$40,055,396	$41,147,200	$39,260,554
TOTAL EXPENDITURES ADMINISTERED BY DEPARTMENT OF MINES AND ENERGY	$48,842,245	$52,238,200	$48,589,414

LEGISLATION

INTRODUCTION

The Nova Scotia Department of Mines and Energy receives it mandate from the Public Service Act. This Act provides for a Department of Mines and Energy and the appointment of a Deputy Minister. It also provides for the function of the Department and its employees.

The following Acts are administered by the Department of Mines and Energy.

Mineral Resources Act S.N.S. 1975, c.12.

The Mineral Resources Act governs the disposition of mineral rights for the exploration and development, administrative procedures, resources management requirements, and royalties. Stone, sand, gravel, peat, some gypsum and limestone, oil, gas, and oil shale fall outside this Act. Coal, salt, potash, and uranium may only be worked under license by Order of the Governor in Council. There is a moratorium on all uranium exploration activity in the Province.

Treasure Trove Act R.S.N.S. 1967, c.314.

The Treasure Trove Act regulates the exploration for precious stones and metals in a state other than their natural state. Forms for exploration and royalties are provided by Order of the Governor in Council.

Coal Mines Regulation Act S.N.S. 1967, c.36

The Coal Mines Regulation Act governs operation and safety in provincial coal mines. Coal mines operated by the Federal Government through Crown corporations, such as the Cape Breton Development Corporation, are inspected and regulated under the Canada Labour Code.

Gas Storage Exploration Act

The Gas Storage Exploration Act governs exploration and development of underground storage of liquid or gaseous petroleum products.

Metalliferous Mines and Quarries Act R.S.N.S. 1967, c. 183.

The Metalliferous Mines and Quarries Act governs operation and safety in mines and quarries that are not otherwise covered by the Coal Mines Regulation Act. Quarries operated by the Department of Transport do not fall under this Act.

Gypsum Mining Income Tax Act R.S.N.S. 1967, c.122.

The Gypsum Mining Income Tax Act provides for reporting procedures and income tax formulae for gypsum mining operations in the Province.

An Act to Confer Certain Powers Upon the Lieutenant Governor in Council and to Amend the Mines Act.

Certain powers are conferred on the Lieutenant Governor in Council for the purposes of maintaining an acceptable level of stability in the Coal Mining Industry. The Act provides authority for a subvention program for independent coal mine operators, a pre-retirement leave program, coal waste dumps reclamation project, and operation of Novaco.

Petroleum Resources Act S.N.S. 1980, c.12.

The Petroleum Resources Act came into force July 28, 1984 and it regulates the administration and distribution of petroleum rights in Nova Scotia. By amendment, (S.N.S. 1984 c.64) the Governor in Council may limit the application of this Act to the onshore region.

Energy and Mineral Resources Conservation Act S.N.S. 1980, c.5.

The Energy and Mineral Resources Conservation Act provides authority to establish an Energy Board to hear matters arising out of such Acts as the Gas Utilities Act, Pipeline Act, etc. By amendment (S.N.S. 1984, c.60) the Governor in Council may amend the application of this Act and may designate the Public Utilities Board of Commissioners as the Energy Board. This Act and the amendment came into force July 28, 1984.

Gas Utilities Act S.N.S. 1980, c.7.

The Gas Utilities Act regulates the process wherein an applicant may seek and obtain approval for a franchise to operate a gas utility. By amendment (S.N.S. 1984, c.61) the Act may be limited to certain geographic areas and certain operations. The Act and amendment came into force July 28, 1984.

Pipeline Act S.N.S. 1980, c.13.

The Pipeline Act regulates all aspects of transmission of oil and gas. The Act may be limited to certain transmission lines and certain geographic areas as provided for in S.N.S. 1984, c.65. The Act and amendment came into force July 28, 1984.

Canada-Nova Scotia Oil and Gas Agreement Act S.N.S. 1984, c.12.

The Canada-Nova Scotia Oil and Gas Agreement Act mirrors federal legislation implementing and giving effect to the Canada-Nova Scotia Agreement on Offshore Oil and Gas Resource Management and revenue sharing providing the framework for administration and regulation of offshore oil and gas exploration and production.

Offshore Oil and Gas Act S.N.S. 1984, c.8.

The Offshore Oil and Gas Act is another of the offshore legislation package. This Act, along with the federal counterpart, regulate acquisition and disposition of offshore oil and gas rights. Crown share, Canadian ownership rates, transfers, and other matters are also addressed.

Oil and Gas Production and Conservation (Nova Scotia) Act

Exploration, drilling, development, and production of oil and gas in the offshore are regulated by the Oil and Gas Production and Conservation (Nova Scotia) Act and the federal counterpart.

APPENDIX A

PUBLICATIONS FOR FISCAL YEAR 1984-85

Energy Branch

Conservation for Public Buildings
Free

Controlling Condensation in the Home
Free

Energy Conservation for Individuals . . . A Guide to Government Programs
Free

Energy Publications Guide
Free

Forest Residue Wood Chip Substitution Study
Free

Introduction to the Offshore
Free

1984 Energy Statistical Profile
Free

Small Business Energy Analysis Program
Free

Nova Scotia Oil and Gas Report
$2.00

An Introduction to the Offshore
Free

Mines and Minerals Branch

Report 84-1 Mines and Minerals Branch, Report of Activities, 1983, 352 pages.
Hardcopy $10.00, Microfiche $4.00

Report 84-2 — Index to Assessement Reports 1983 (with Keyword Index), by N.A. Lyttle and J. Gillespie-Wood, 88 pages.
Hardcopy $8.50, Microfiche $2.00

Report 84-3 — Index to Publications and Open File Reports for 1981, 1982 and 1983 (with Keyword Index), by N.A. Lyttle and J. Gillespie-Wood, 152 pages.
Hardcopy $13.50, Microfiche $3.50

Report 84-4 — Keyword Index to Theses in Report 81-6, Index to Publications, Open File Reports and Theses 1862-1980, by D. B. Hopper, J. Gillespie-Wood and N. A. Lyttle.
Microfiche only $5.00

Report 84-5 — Drilling Logs of Government Core Drills, 1983, compiled by I. MacDougall and D. E. Polley, 1983, 38 pages.
Hardcopy $3.50, Microfiche $2.00

Information Series No. 7 — Program and Summaries, Eighth Annual Open House and Review of Activities, by Nova Scotia Department of Mines and Energy, 1984, 115 pages.
Hardcopy $2.00, Microfiche $1.00

Reprint 84-1 — Proceedings of the Deformation Study Group, Caledonide Orogen Project, by J. D. Keppie, D. G.. Gee, D. Roberts, D. Powell, M. D. Max, P. Osberg, A. Pique, and J. P. Lecorche. Reprinted from Regional Trends in the Geology of the Appalachian-Caledonian-Hercynian-Mauritanide Orogen, edited by P. E. Schenk, 1983, p. 275-278.
$1.50

Reprint 84-2 — Times of Deformation in the Canadian Appalachians, by J. D. Keppie, P. St. Julien, C. Hubert, J. Beland, B. Skidmore, L. R. Fyffe, A. A. Ruitenberg, S. R. McCutcheon, H. Williams and J. Bursnall. Reprinted from Regional Trends in the Geology of the Appalachian-Caledonian-Hercynian-Mauritanide Orogen, edited by P. E. Schenk, 1983, p. 307-313.
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Reprint 84-3 Petrology and Geochemistry of Devono-Carboniferous Volcanic Rocks in Nova Scotia, by J. Dostal, J. D. Keppie and C. Dupuy. Reprinted from Maritime Sediments and Atlantic Geology, 19, 1983, p. 59-71.
$1.50

Reprint 84-5 Mining in Nova Scotia-Past and Present, by Howard V. Donohoe, Jr. Reprinted from CIM Directory 1984, p. 1-24.
$1.50, Microfiche $1.00

Reprint 84-6 Discriminant and Factor Analysis of Geochemical Data from Granitoid Rocks Hosting the Millet Brook Uranium Mineralization, South Mountain Batholith, Nova Scotia, by A. K. Chatterjee and D. F. Strong. Reprinted from Uranium, 1, 1984, p. 289-305.
$3.00

Map 84-1 Geological Map of the Cochrane Hill Open-Pit Gold Deposit, Guysborough County, Nova Scotia, by P. K. Smith, scale 1:66.7.
$8.00

APPENDIX B

PRODUCTION INFORMATION FROM MINES, QUARRIES AND OTHER OPERATIONS

In this appendix each production site is described and located. Tables B-1 to B-4 summarize the production figures for each commodity or mineral. Site locations are shown on the accompanying maps, Figures B-1 to B-3. Production data is for the calendar year (January 1, 1984 to December 31, 1984).

The mining industry in Nova Scotia employed more than 6300 people. The value of the materials produced is in excess of $300,000.00.

BASE METAL AND GOLD MINES

No gold or base metals were produced during the calendar year, however, there was continued interest in reopening some of the old gold mines in southern Nova Scotia.

RIO ALGOM LTD., East Kemptville Tin Mine

Manager: K. Collison
Address: P. O. Box 6, East Kemptville, N. S. B0W 1Y0

Construction started in May 1984 and the mine is expected to be in production in late 1985.

The mining rate from the open pit mine will be 9900 tons/day (9000 t/d). The annual output of metals contained in concentrates is expected to be 4850 tons (4400 t) of tin, 2650 tons (2400 t) of zinc, and 1650 tons (1500 t) of copper.

COAL MINING OPERATIONS

At the beginning of 1984 there were five underground coal mines, two open pit coal mines, and two coal dump reclamation plants in operation. Table B-1 summarizes production information for the coal mines. The location of these operations is shown in Figure B-1.

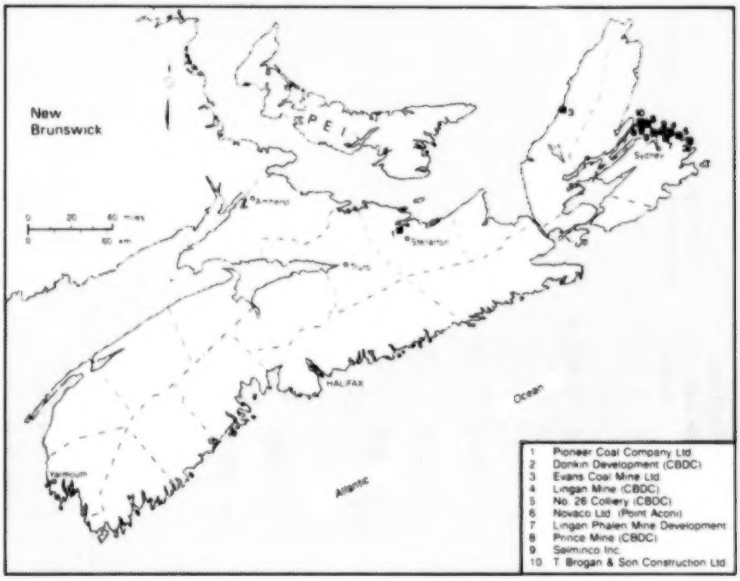


FIGURE B.1. Location of coal mining operations

Underground Coal Mines

DRUMMOND COAL COMPANY LTD. (PIONEER COAL COMPANY)

Manager: G. Dooley
Address: P.O. Box 929, Westville, N. S. B0K 2A0
Production: The production statistics are included under the Pioneer Coal Company in the open pit coal mining section.
Employees:

The assets of the Drummond Coal Company were purchased from the Estate of Henry Thompson by Pioneer Coal Company in February, 1985 and the mine was renamed.

The Drummond No. 2 underground mine is located near Westville, Pictou County. The coal was extracted from the Drummond Mine by room and pillar mining methods.

TABLE B-1. Coal production for calendar year 1984

COMPANY	MINE NAME	LOCATION	PRODUCTION (salable coal) tons	PRODUCTION (salable coal) tonnes	NUMBER EMPLOYED[1]	APPROXIMATE VALUE[3]
Underground Mining						
Cape Breton Development Corp. (CBDC)	Prince Mine No.26 Colliery Lingan Mine	Point Aconi, Cape Breton County Glace Bay, Cape Breton County Lingan, Cape Breton County	3,028,932[2]	2 747 829[2]	4,417	
Evans Coal Mines Ltd.		St. Rose, Inverness County	50,941	46 213	51	
Pioneer Coal Company		Westville, Pictou County	42,156	38 244	33	
		TOTAL (underground)	3,122,029	2 832 286	4,501	
Open Pit Mining						
T. Brogan Ltd.		Point Aconi, Cape Breton County	50,202	45 543	14	
Novaco		Point Aconi, Cape Breton County Springhill, Cumberland County	153,532	139 283	49	
		TOTAL (open pit)	203,734	184 826	63	

TABLE B-1. Continued

COMPANY	MINE NAME	LOCATION	PRODUCTION (salable coal) tons	tonnes	NUMBER EMPLOYED[1]	APPROXIMATE VALUE[3]
Reclamation						
Selminco Inc.		Sydney Mines, Cape Breton County	137,715	124 934	51	
		TOTAL (reclamation)	137,715	124 934	51	
		TOTAL FOR ALL COAL PRODUCERS	3,463,478	3 142 046	4,615	$166,272,697

[1]personnel employed in clerical, supervisory, etc. positions as well as mining personnel
[2]washed coal
[3]estimate from Nova Scotia Department of Mines and Energy sources

A fire occurred on August 23th in the main slope while work was underway to repair a rock fall. The mine was sealed the following week and subsequently abandoned. Pioneer Coal Company is commencing development of a surface coal mine on the site.

EVANS COAL MINES LTD.

Manager:	G. Evans
Address:	R.R. #1, Inverness, N. S. B0E 1N0
Production:	50,941 tons (46 213 t) coal
Employees:	51

The St. Rose Colliery, Inverness County, is owned and operated by Evans Coal Mines Ltd. The entire output is produced by room and pillar mining methods with the use of slushers. The coal is transported to the haulage level by chain conveyor, loaded into one-ton mine cars, and hoisted to surface in the main slope.

On Monday, September 10th, following a roof fall in the No. 6 East Counter Level between No. 1 and 2 Balances, the No. 6 East workings were abandoned and all mining operations concentrated on the No. 6 West working area.

CAPE BRETON DEVELOPMENT CORPORATION

Manager:	D. Shield Vice President, Mining Operations
Address:	P. O. Box 2500, Sydney, N. S. B1P 6K9
Production:	3,028,932 tons (2 747 829 t) coal
Employees:	4417

The Cape Breton Development Corporation (CBDC) is a federal crown corporation that operates three producing underground coal mines, all in the Province. The Corporation has two additional underground mines under development near Lingan and Donkin.

Lingan Mine (Harbour Seam)

This mine is located at Lingan near New Waterford. Coal is extracted from underground by fully mechanized advancing longwall faces. Longwall faces 5 West and 8 East were in operation all year. Mining on longwall face 4 West was finished in April 1984. Production began on face 9 East in July 1984. Development is underway to establish face 6 West.

Prince Mine

This mine is located at Point Aconi. Coal is extracted by fully mechanized retreating short wall faces in the mine. Extraction was completed on face 3 West in February 1984, 5 East in November 1984, and 4 East in December 1984. Development is underway to establish faces 4 West and 6 East.

No. 26 Colliery

This mine was located in the Town of Glace Bay. Coal was extracted from underground by fully mechanized advancing longwall faces. This method of working is the same as in the Lingan Mine.

On April 5th at 7 a.m. a fire broke out in the Main Deep near the old No. 5 South longwall. The fire proved impossible to extinguish and the mine was permanently sealed. Unfortunately one man lost his life in the fire.

Open Pit Coal Mines

NOVACO LTD.

Manager:	C. White
Address:	P.O. Box 147, Sydney Mines, N. S. B1V 1Y3
Production:	153,532 tons (139 283 t) coal
Employees:	49

The Point Aconi open pit mine is owned by Novaco, a provincial crown corporation, but the mining is done under contract by Pioneer Coal Company, a subsidiary of Nova Construction Ltd. of Antigonish. The overburden is drilled and blasted, and then removed by a dragline excavator. The coal is loaded into trucks by a backhoe or front-end loader and removed from the pit. The coal reserves are almost exhausted and production will cease in 1985.

PIONEER COAL CO.

Manager:	D. Clifton
Address:	P.O. Box 929, Westville, N. S. B0K 2A0
Production:	42,156 tons (38,244 t) coal (This includes the production from the underground mine prior to its closure.)
Employees:	33

Following the purchase of the assets of the Drummond Coal Company, a small open pit mine was established to test mine the crown pillar of the Scott Seam. This was followed by a further trial open pit on the Acadia Seam crown pillar.

T. BROGAN & SONS CONSTRUCTION LTD.

Manager:	T. Brogan
Address:	P.O. Box 199, Florence, N. S. B0C 1J0
Production:	50,202 tons (45 543 t) coal
Employees:	14

An open pit coal mine is operated at Point Aconi, Cape Breton County by this company. The overburden is removed by a dragline excavator and the exposed coal is ripped with a bulldozer and loaded into trucks with a front-end loader.

Mines Under Development

CAPE BRETON DEVELOPMENT CORPORATION

Donkin Morien Development Project

The construction of the tunnels to gain access to the coal reserves continued in 1984. By December the No. 2 Tunnel had reached the 3500 metre mark and intersected the Harbour Seam. The company report that they intend to take out a bulk sample of coal from this seam for testing.

Lingan Phalen Development Project

The concrete portals for the No. 2 and No. 3 slopes have been completed and driving of the slopes had commenced in December, 1984.

Coal Reclamation Plants

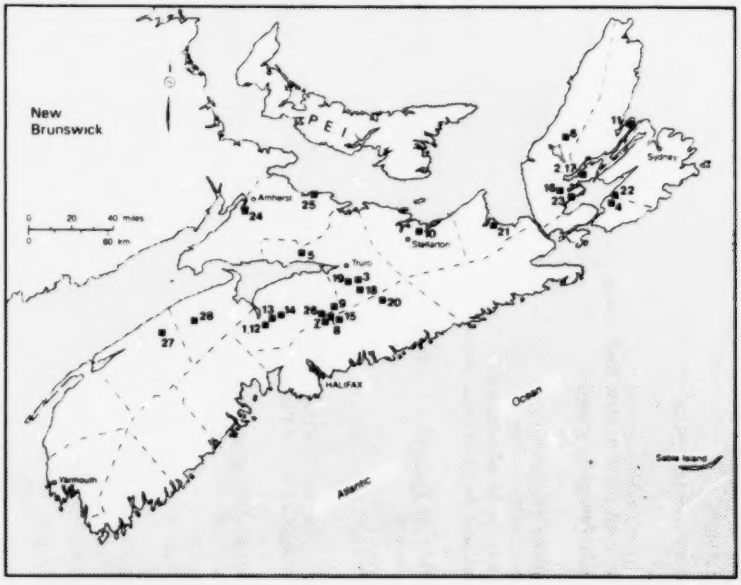
SELMINCO INC.

Manager:	D. Frederickson
Address:	P.O. Box 189, New Waterford, N. S. B1H 4N9
Production:	137,715 tons (124 934 t) reclaimed coal
Employees:	51

The company operates two reclamation plants. One reclamation plant reclaims coal from the Prince Mine Dump at Sydney Mines. The other is reclaiming coal from the dump at Scotstown, near New Waterford.

INDUSTRIAL MINERALS

Industrial minerals form a significant part of the total mineral production in Nova Scotia. Fifteen quarries or mines produce gypsum, salt, anhydrite, limestone, barite, and dolomite. The locations of these mines or quarries is shown on Figure B-2. Table B-2 summarizes production information.



ANHYDRITE
1 Fundy Gypsum Co. Ltd
2 Little Narrows Gypsum Co. Ltd

BARITE
3 Nystone Chemicals Ltd
4 Novex Mining and Exploration Co. Ltd
5 Magcobar Division, Dresser Canada Inc
6 Scotsville Mineral Resources

CLAY AND SHALE
7-10 L.E. Shaw Ltd

DOLOMITE
11 Scotia Limestone Ltd

GYPSUM
12,13 Fundy Gypsum Co. Ltd
14 Domtar Construction Materials
15 National Gypsum Canada Ltd
16 Georgia Pacific Corp. Bestwall Division
17 Little Narrows Gypsum Co. Ltd
18 Canada Cement Lafarge Co. Ltd

LIMESTONE
19 Canada Cement Lafarge Co. Ltd
20 Moaher Limestone Co. Ltd.
21 Ridge Brokers Ltd.
22 Scotia Limestone Ltd
23 Nova Scotia Sand and Gravel Ltd (Marble)

SALT
24 Sifto Salt Division, Domtar Chemicals Group
25 Canadian Salt Company Ltd

SILICA SAND
26 Nova Scotia Sand and Gravel Ltd

STONE
27 Heritage Memorials Ltd

PEAT MOSS
28 Annapolis Valley Peat Moss Co

FIGURE B.2. Location of industrial minerals and miscellaneous commodities production

TABLE B-2. Industrial minerals production for calendar year 1984

COMPANY	LOCATION	PRODUCTION tons	PRODUCTION tonnes	NUMBER EMPLOYED[1]	APPROXIMATE VALUE[2]
Gypsum					
Fundy Gypsum Co. Ltd.	Miller Creek and Wentworth, Hants County	1,549,081	1 405 317	188	
Little Narrows Gypsum Co.	Little Narrows, Victoria County	910,618	826 108	86	
Domtar Construction Materials Ltd.	Windsor, Hants County	12,820	11 630	12	
National Gypsum (Canada) Ltd.	Milford, Halifax County	2,994,661	2 716 739	126	
Georgia Pacific Corp.	River Denys, Inverness County	1,072,312	972 795	50	
Canada Cement LaFarge, Ltd.	Upper Brookfield, Colchester County	13,664	12 396	see limestone	
	TOTAL (gypsum)	6,553,156	5 944 985	462	$40,980,546
Anhydrite					
Fundy Gypsum Co. Ltd.	Miller Creek, and Wentworth, Hants County	120,137	108 988	see gypsum	
Little Narrows Gypsum Co. Ltd.	Little Narrows, Victoria County	74,450	67 541	see gypsum	
	TOTAL (anhydrite)	194,588	176 529		
Salt					
Canadaian Salt Co. Sifto Salt Division	Pugwash, Cumberland County	762,904	692 102	190	
Domtar Chemical Group	Nappan, Cumberland County	63,188	57 324	96	
	TOTAL (salt)	826,092	749 426	286	$32,384,648[3]

TABLE B-2. Continued

COMPANY	LOCATION	PRODUCTION tons	PRODUCTION tonnes	NUMBER EMPLOYED[1]	APPROXIMATE VALUE[2]
Limestone					
Ridge Brokers Ltd.	Southside Harbour, Antigonish County	33,069	30 000	3	
Canada Cement Lafarge, Ltd.	Brookfield, Colchester County	573,410	520 194	14	
Scotia Limestone Ltd.	Irish Cove, Cape Breton County	88,970	80 713	13	
Mosher Limestone Ltd.	Upper Musquodoboit, Halifax County	138,201	125 375	24	
N.S. Sand & Gravel Ltd.	Marble Mountain, Inverness County	nil	nil		
	TOTAL (limestone)	833,650	756 282	54	$ 6,168,235
Dolomite					
Scotia Limestone	Kellys Cove, Victoria County TOTAL (dolomite)	33,069	30 000	6	$ 210,000
Barite					
Nystone Chemicals Ltd.	Brookfield, Colchester County	32,000	29 030	28	
Novex Mining and Exploration, Ltd.	East Bay, Cape Breton County	27,558	25 000	6	
Magcobar Division, Dresser Canada Inc.	Bass River, Colchester County	3,104	2 816	5	
Scotsville Mineral Resources Limited	Scotsville, Inverness County	9,369	8 500	25	
	TOTAL (barite)	72,031	65 346	64	$ 1,088,650[3]

TABLE B-2. Continued

COMPANY	LOCATION	PRODUCTION tons	PRODUCTION tonnes	NUMBER EMPLOYED[1]	APPROXIMATE VALUE[2]
Clay					
L. E. Shaw Ltd.	Lantz, Halifax County Shubenacadia, Halifax County	17,637	16 000	4	96,000
Shale					
L. E. Shaw Ltd.	Milford, Hants County New Glasgow, Pictou County	28,660	26 000	see clay	
	TOTAL (clay and shale)	46,297	42 000	—	$ 156,000
Silica Sand					
Nova Scotia Sand and Gravel Ltd.	Nine Mile River, Hants County TOTAL (silica sand)	121,253	110 000	14	$ 3,080,000[3]
	TOTAL FOR INDUSTRIAL MINERALS	8,680,135	7 874 568	886	$85,259,649[2]

[1]total employees: mining, production, clerical, supervisory, etc.
[2]estimate from Nova Scotia Department of Mines and Energy sources
[3]processed or manufactured value

Gypsum and Anhydrite

CANADA CEMENT LAFARGE LTD.

Manager:	D. King
Address:	P.O. Box 5, Brookfield, N. S. B0N 1C0
Production:	13,664 tons (12 396 t) gypsum
Employees:	See under Limestone

A small quarry was opened in 1983 to supply the internal requirements of the cement plant at Brookfield, Colchester County. It is only operated on an intermittent basis.

DOMTAR CONSTRUCTION MATERIALS LTD.

Manager:	S. G. Johnson
Address:	P.O. Box 758, Windsor, N. S. B0N 2T0
Production:	12,820 tons (11 630 t) gypsum
Employees:	12

Domtar Construction Materials Ltd. operates a small gypsum quarry at MacKay Settlement, Hants County. The actual quarry operation is done under contract by D. MacDonald.

Domtar calcines its gypsum locally. It is the only company to process its gypsum within the Province.

FUNDY GYPSUM CO. LTD.

Manager:	G. Raymond
Address:	P.O. Box 400, Windsor, N. S. B0N 2T0
Production:	120,137 tons (108 988 t) anhydrite
	1,549,081 tons (1 405 317 t) gypsum
Employees:	188

The Fundy Gypsum Co. Ltd. operates two quarries and crushing plants located in the Wentworth Creek and Miller Creek areas near Windsor, Hants County. After selective quarrying, the materials are crushed and transported via unit train to shiploading facilities at Hantsport for shipment to wallboard manufacturing plants in the United States. The Wentworth Creek operation produces anhydrite and gypsum, and the Miller Creek operation produces gypsum only.

GEORGIA PACIFIC CORPORATION

Manager:	J. Graham
Address:	P.O. Box 400, Port Hawkesbury, N. S. B0E 2V0
Production:	1,072,312 tons (972 795 t) gypsum
Employees:	50

This company operates a quarry situated at River Denys, Inverness County. The gypsum is transported by rail to shiploading facilities at Port Hastings. At the quarry the overburden is stripped by a dragline excavator and the gypsum is recovered by shovel and truck.

The company has obtained the necessary permits from the Department of the Environment to commence operation at a new gypsum mine at Sugar Camp Lake. Gypsum production will gradually be transferred to Sugar Camp Lake from the present mining area, which will be closed and the site rehabilitated.

LITTLE NARROWS GYPSUM COMPANY LTD.

Manager:	T. H. Davis
Address:	Little Narrows, N. S. B0E 1T0
Production:	74,450 tons (67 541 t) anhydrite
	910,618 tons (826 108 t) gypsum
Employees:	86

The company operates a gypsum and anhydrite quarry at Little Narrows, Victoria County, with shiploading facilities on the Bras d'Or Lakes.

The company has obtained the necessary permits from the Department of the Environment to extend the mine workings into an area adjacent to the present workings.

NATIONAL GYPSUM (CANADA) LTD.

Manager:	P. Mills
Address:	P.O. Box 637, Dartmouth, N. S. B2Y 3Y9
Production:	2,994,661 tons (2 716 739 t) gypsum
Employees:	126

National Gypsum operates the largest gypsum quarry in the Province at East Milford, Halifax County, and a shiploading facility at Wrights Cove, Dartmouth. Unit trains transport the gypsum from the quarry to dockside where it is shipped to wallboard manufacturing plants in the United States.

Salt

CANADIAN SALT CO. LTD.

Manager: D. Hoskins
Address: P.O. Box 160, Pugwash, N. S. B0K 1L0
Production: 762,904 tons (692 102 t) salt
Employees: 190

The Pugwash Mine is located in Pugwash, Cumberland County. A room and pillar system of extraction is employed utilizing trackless diesel equipment. This plant produces industrial grades of salt, blocks for farm use, and refined salt for domestic consumption. The industrial grades are either supplied in bulk for truck transportation, bagged for rail transportation, or transported in bulk or bags to storage and shiploading facilities at the Pugwash Harbour wharf.

In November 1983, a serious water leak developed in the No. 1 shaft at the point of contact between the overburden and the bedrock, approximately 360 feet from the surface. Stemming the water flow was extremely difficult. The leak was finally stopped after the company cast a concrete plug within the shaft at the point of the leak. This work required the removal of the manway from the shaft. The concrete plug has circular openings through it to allow for normal ventilation and the operation of a specially designed hoist and cage to permit the removal of personnel from the mine in the event of a problem in the No. 2 shaft.

DOMTAR CHEMICALS GROUP, SIFTO SALT DIVISION

Manager: R. E. Simmie
Address: P.O. Box 550, Amherst, N S. B4H 4A1
Production: 63,188 tons (57 324 t) salt
Employees: 96

Domtar Chemicals Group, Sifto Salt Division, operates a solution salt mine located near Nappan, Cumberland County. The mining procedure involves the drilling of a bore hole into the underground salt deposit. Water is pumped down to the deposit where it dissolves the salt, forming brine. The brine is then forced back to the surface where the salt is extracted using the "vacuum pan" process.

Barite

NYSTONE CHEMICALS LTD.

Manager: V. Prostak
Address: P.O. Box 64, Debert, N. S. B0M 1G0

Production:	32,000 tons (29 030 t) ore mined 460 tons (417 t) pharmaceutical barite concentrate, 10,000 tons (10 160 t) drilling mud grade barite
Employees:	Total: 28

The barite ore is mined and crushed by a contractor at the mine site northeast of Brookfield, Colchester County. The company installed a jig at the mine site during the year. The coarse concentrate from the jig is sold for use in drilling mud and the fine concentrate is sent to the company's Debert plant for upgrading to a pharmaceutical grade barite product.

ATLANTIC BARITE CO. (BASS RIVER)

Owner:	W. A. Digdon
Address:	P.O. Box 84, Great Village, N. S. B0M 1L0
Production:	3,104 tons (2 816 t) barite
Employees:	5

A small barite deposit on the Bass River, north of Bass River, Colchester County, was worked during the year by Magcobar on behalf of the Atlantic Barite Co. All the accessible ore was recovered and the mining area rehabilitated.

NOVEX MINING AND EXPLORATION LTD.

Manager:	B. Coffin
Address:	East Bay, Cape Breton, Nova Scotia
Production:	27,558 tons (25 000 t) ore mined 4,850 tons (4 399 t) barite concentrate
Employees:	6

The mine and mill operated intermittently throughout the year. The mine is located near Lockside, Richmond County and the mill at Enon, Cape Breton County. All the product was dried and bagged for sale to drilling mud companies.

SCOTSVILLE MINERAL RESOURCES LTD.

Owner:	R. S. Patterson
Address:	1000 MicMac Blvd., Dartmouth, N.S. B3A 4M7
Employees:	25

This company is establishing a small barite mine at Scotsville, Inverness County. A quantity of ore has been mined and stockpiled pending the construction of a mill.

Limestone and Dolomite

CANADA CEMENT LAFARGE LTD.

Manager: D. King
Address: P.O. Box 5, Brookfield, N. S. B0N 1C0
Production: 573,410 tons (520 194 t) limestone
Employees: 128

Canada Cement Lafarge Ltd. operates a limestone quarry and plant at Brookfield, Colchester County. The total production from the quarry is processed at the on-site cement manufacturing plant, owned and operated by the company.

The plant operated well below its rated capacity due to the current economic conditions. The output of Portland Cement from the plant was approximately 196,840 tons (200 000 t).

MOSHER LIMESTONE LTD.

Manager: R. Mosher
Address: P.O. Box 28, Upper Musquodoboit, N.S. B0N 2M0
Production: 138,201 tons (125,375 t) limestone
Employees: 24

Mosher Limestone operates two quarries on a rotating basis in the Upper Musquodoboit area of Halifax County and produces an agricultural grade dolomite and limestone. The product, when processed, is supplied in bulk or bagged for wide distribution throughout the Atlantic Provinces as a soil conditioner.

RIDGE BROKERS LTD.

Manager: A. Alward
Address: P.O. Box 59, Havelock, N. B. E0A 1W0
Production: 33,069 tons (30 000 t) limestone
Employees: Total: 3

The company operates a small limestone quarry at South Side, Antigonish Harbour, Antigonish County.

SCOTIA LIMESTONE LTD.

Manager:	L. P. Kent
Address:	P.O. Box 457, Sydney, N. S. B1P 6H4
Production:	88,970 tons (80 713 t) limestone
	33,069 tons (30 000 t) dolomite
Employees:	19

Production of limestone from the Irish Cove deposit continued and the first shipments of dolomite were made from the Kelly Cove deposit.

Clay, Shale, Industrial Sand, Marble

L. E. SHAW LTD.(INCLUDING NOVA SCOTIA SAND AND GRAVEL)

President:	A. Shaw
Address:	5251 Duke Street, Halifax, N.S. B3J 1P3
Production:	46,297 tons (44 000 t) clay and shale
	121,253 tons (110 000 t) industrial sand
Employees:	Total: 18

L. E. Shaw and its subsidiary company, Nova Scotia Sand and Gravel, operate seven properties in Nova Scotia. The clay and shale are quarried from pits at Lantz, Milford, and Shubenacadie (all in Hants County), and a quarry in New Glasgow, Pictou County. The materials quarried are used in the company plant located in Lantz, Hants County, for the manufacture of bricks and tiles. The company also produces industrial sand at Elmsdale, Brazil Lake, and Sandy Desert, and architectural limestone from the Marble Mountain quarry.

Brick production from the Lantz plant was 18,150,000 tons (16 500 000 t) and this plant employed an additional 55 people.

AGGREGATE RESOURCES

Crushed stone and sand and gravel comprise the structural materials category. Production information is summarized in Table B-3.

Crushed Stone

The Province had 12 rock quarry operations which produced a total of 5,741,630 tons (5 208 773 t) in 1983 and employed 201 men. Individual company figures are shown in Table B-3 and are located on Figure B-3.

TABLE B-3. Aggregate materials production, 1984

	COMPANY	LOCATION (Head Office)	PRODUCTION TONS	PRODUCTION TONNES	NUMBER EMPLOYED	APPROXIMATE VALUE
	Crushed Stone					
1.	Conrad Brothers Ltd.	Montague, Halifax County	753,388	683 469	36	
2.	Construction Aggregates Ltd.	Mulgrave, Guysborough County	826,725	750 000	31	
3.	Gateway Materials Ltd.	Kearney Lake Rd., Halifax County	463,324	420 325	23	
4.	LeVatte Construction Company Ltd.	Sydney, Cape Breton County	193,512	175 553	11	
5.	Colin R. MacDonald Ltd.	Antigonish, Antigonish County	3,129	2 839	6	
6.	Rocky Lake Quarry Ltd.	Bedford, Halifax County	1,312,760	1 200 000	22	
7	Permanent Concrete	Folly Lake, Colchester County	515,520	467 677	11	
8.	Satellite Equip. (1972) Ltd.	New Glasgow, Pictou County	371,691	337 196	26	
9.	South Shore Sand & Gravel Ltd.	Bridgewater, Lunenburg County	76,684	69 567	9	
10.	Steed & Evans Ltd.	Dartmouth, Halifax County	66,138	60 000	6	
11.	S. W. Weeks Const. Ltd.	New Glasgow, Pictou County	165,345	150 000	8	
12.	W. Eric Whebby Ltd.	Dartmouth, Halifax County	762,954	692 147	12	
		TOTAL (crushed stone)	5,511,170	5 008 773	201	$ 24,893,601[2]
	Sand and Gravel					
13.	Aberdeen Paving Ltd.	Halifax, Halifax County	600,753	545 000	100	
14.	Acadia Road Contractors Ltd.	Bridgewater, Lunenburg County	296,056	268 580	19	
15.	Briggs Construction	Bras D'Or, Cape Breton County	7,393	6 707	5	
16.	Budget Paving Ltd.	Liverpool, Queens County	11,464	10 400	4	
17.	Doug Burns Excavation Contracting Ltd.	Sydney, Cape Breton County	27,395	24 835	7	
18.	Chaisson Brothers Ltd.	Cheticamp, Inverness County	5,512	5 000	3	
19.	Gordon F. Creelman Ltd.	Stewiacke, Colchester County	2,282	2 070	1	
20.	Cumberland Paving & Contr. Ltd.	Amherst, Cumberland County	110,230	100 000	16	
21.	Day and Reid	Shubenacadie, Hants County	7,165	6 500	3	
22.	Raymond Delorey Dozing	Larry's River, Guysborough County	3,582	3 250	6	
23.	Gus D'Eon Excavating Ltd.	West Pubnico, Yarmouth County	32,959	29 900	5	

TABLE B-3. Continued

	COMPANY	LOCATION (Head Office)	PRODUCTION TONS	PRODUCTION TONNES	NUMBER EMPLOYED	APPROXIMATE VALUE
24.	Dexter Construction Ltd.	Bedford, Halifax County	230,381	209 000	7	
25.	Dillman Enterprises Ltd.	Shubenacadie, Colchester County	608,437	551 973	16	
26.	Dominion Atlantic Railway (C.P.R.)	Saint John, New Brunswick	7,716	7 000	—	
27.	Dunn Const. Co. Ltd.	Baddeck, Victoria County	168,457	152 823	5	
28.	Ettinger Enterprises Ltd.	Noel, Hants County	2,001	1 815	1	
29.	John W. Fancy	Bridgewater, Lunenburg County	5,732	5 200	5	
30.	L. & M. Gallant Contr., Trucking Ltd.	Elmsdale, Hants County	44,092	40 000	8	
31.	Gillis Const (C.B.) Ltd.	Baddeck, Victoria County	2,205	2 000	3	
32.	Hatchet Lake Excavations	Armdale, Halifax County	20,062	18 200	5	
33.	Roy Hiltz Excavators Ltd.	Kingston, Kings County	34,309	31 125	5	
34.	Inter Supply Ltd.	New Glasgow, Pictou County	132,276	120 000	15	
35.	Francis Johnson Ltd.	Head Chezzetcook, Halifax County	15,089	13 689	10	
36.	G. K. Keddy (L. E. Shaw)	Lantz, Hants County	181,880	165 000	5	
37.	Kell's Enterprises Ltd.	Antigonish, Antigonish County	8,818	8 000	5	
38.	Logan Langille	Wentworth, Cumberland County	3,442	3 123	1	
39.	Lettimer Construction Ltd.	Truro, Colchester County	85,979	78 000	7	
40.	Malcolm S. MacDonald Co. Ltd	Sydney River, Cape Breton County	27,558	25 000	6	
41.	MacDonald's Excavating	Pictou, Pictou County	4,002	3 631	4	
42.	J. P. MacInnis Trucking	Whycocomagh, Inverness County	5,015	4 550	2	
43.	D. W. Matheson & Sons	Little Narrows, Victoria County	34,643	31 428	4	
44.	Martell's Const. Ltd.	North Sydney, Cape Breton County	519,590	471 369	15	
45.	Maurice's Ready-Mix Ltd.	Kentville, Kings County	15,339	13 915	3	
46.	Meadows Sand & Gravel Ltd.	Sydney, Cape Breton County	110,230	100 000	5	
47.	N. Melanson	Saulnierville, Digby County	14,330	13 000	4	
48.	Moore Enterprises	Deep Brook, Digby County	17,169	15 600	6	
49.	Mosher & Rawding Ent. Ltd.	Liverpool, Queens County	57,320	52 000	3	
50.	Municipal Ready-Mix Ltd.	Sydney, Cape Breton County	507,055	460 000	45	
51.	New Minas Contracting	New Minas, Kings County	2,866	2 600	8	
52.	North River Sand & Gravel Ltd.	Truro, Colchester County	10,002	9 074	5	

TABLE B-3. Continued

	COMPANY	LOCATION (Head Office)	PRODUCTION TONS	PRODUCTION TONNES	NUMBER EMPLOYED	APPROXIMATE VALUE
53.	Nova Scotia Sand & Gravel Ltd.	Halifax, Halifax County	319,667	290 000	18	
54.	G. W. Oickle	Bridgewater, Lunenburg County	34,392	31 200	—	
55.	Permanent Concrete Ltd.	Folly Lake, Cumberland County	128,880	116 919	11	
56.	Pictou County Excavators Ltd.	New Glasgow, Pictou County	7,165	6 500	11	
57.	Arthur Pugsley	Five Islands, Colchester County	2,436	2 210	3	
58.	Scott Paper International	New Glasgow, Pictou County	392,929	356 465	—	
59.	W. K. Sharpe & Sons Const. Ltd.	Windsor, Hants County	16,535	15 000	2	
60.	V. H. Shaw	Avonport, Kings County	72,752	66 000	2	
61.	D. M. Snow Construction	Barrington Passage, Shelburne County	7,165	6 500	3	
62.	Standard Paving Maritime Ltd.	Halifax, Halifax County	289,483	262 617	20	
63.	Tidewater Const. Co. Ltd.	Lower Sackville, Halifax County	112,767	102 302	22	
64.	Timberland Holdings	Hantsport, Hants County	126	114	—	
65.	Earle Toole Trucking Ltd.	Truro, Colchester County	23,902	21 684	4	
66.	Warren Maritimes Ltd.	New Glasgow, Pictou County	403,856	366 376	18	
67.	Max White Excavating	Porters Lake, Halifax County	21,716	19 701	7	
68.	Will-Kare Paving & Const. Ltd.	Truro, Colchester County	110,230	100 000	7	
69.	Yarmouth Concrete & Gravel Ltd.	Yarmouth, Yarmouth County	110,230	100 000	5	
70.	Zutphen Brothers Const. Ltd.	Port Hood, Inverness County	5,732	5 200	1	
		Subtotal	6,040,749	5 480 145	511	22 852 204[2]
		NON-REPORTING (mainly Nova Scotia Department of Transportation)	2,082,669	1 889 385	72	7 878 735[2]
		TOTAL (sand and gravel)	8,123,418	7 369 530	583	30,730,939
		TOTAL FOR AGGREGATE MATERIALS PRODUCTION	13,634,588	12 378 303	784	55,624,540

[1]Locations of head offices are shown by number on Figure B-3.
[2]Estimate from Department of Mines and Energy sources.

Sand and Gravel

There were 58 private sector producers of sand and gravel operating in the Province. Production was 6,040,760 tons (5 480 145 t) and 511 people were employed. Total production, which includes production for the Nova Scotia Department of Transportation, was 8,123,418 tons (7 369 530 t). Detailed production figures are shown in Table B-3; locations are on Figure B-3.

MISCELLANEOUS MATERIALS

The production of miscellaneous materials is shown in Table B-4. Locations are given on Figure B-3.

Dimension Stone

HERITAGE MEMORIAL LTD.

Owner:	M. Nelson
Address:	P.O. Box 308, Windsor, N.S. B0N 2T0
Production:	331 tons (300 t)
Employees:	3

The company periodically operates a small quarry at Nictaux West, Annapolis County, to obtain grey granite as part of its requirements for memorial works at Windsor. The operation depends upon market requirements.

ARSENAULT MONUMENT WORKS LTD.

Owner:	P. Arsenault
Address:	P.O. Box 1475, Antigonish, N.S. B3B 2L4

Arsenault Monument Works Ltd. periodically operates a quarry at Lock Katrine, Antigonish County, for the production of dimension stone used in memorials. No production was recorded in 1984.

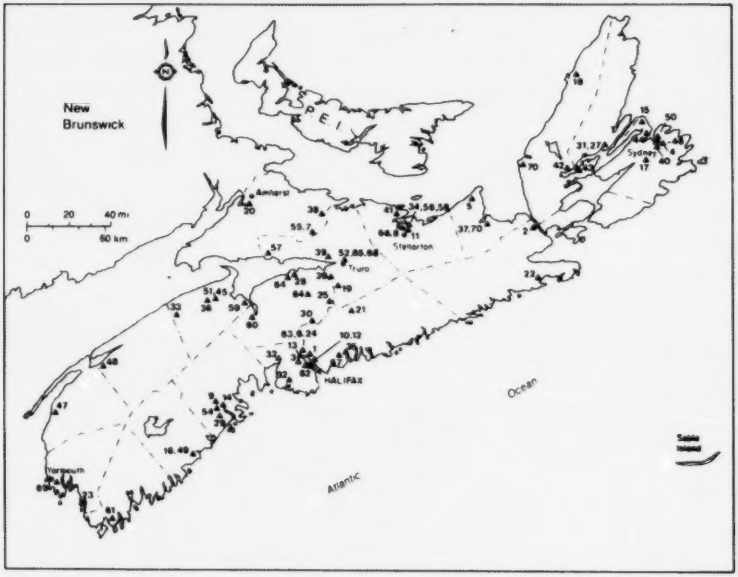


FIGURE B.3. Location of aggregate resources production. Numbers refer to names in Table B-3.

Peat Moss

ANNAPOLIS VALLEY PEAT MOSS CO.

President:	H. Endres
Address:	Berwick, Nova Scotia B0P 1E0
Production:	7,716 tons (7000 t) peat moss
Employees:	15 (some part-time)

The peat bog is some 500 acres (200 ha) in area and during the five summer months up to 19,600 cubic feet (500 m) per day are harvested depending upon the weather.

TABLE B-4. Miscellaneous commodity production for calendar year 1984

COMPANY	LOCATION	PRODUCTION tons	PRODUCTION tonnes	TOTAL NUMBER EMPLOYED[1]	APPROXIMATE VALUE[2] $
Dimension Stone					
Heritage Memorials Ltd.	Quarry: Nictaux, Annapolis County Plant: Windsor, Hants County	331	300	3	$ 1,800
Nova Scotia Sand and Gravel	Quarry: Marble Mountain, Inverness County	2,205	2 000	3	$ 12,000
	TOTAL (dimension stone)	2,536	2 300	6	$ 13,800
Peat Moss					
Annapolis Valley Peat Moss Company	Berwick, Kings County TOTAL (peat moss)	7,716	7 000	15	$1,535,000[3]
	TOTAL FOR MISCELLANEOUS COMMODITY PRODUCTION	10,252	9 300	21	$1,548,800

[1]total number of employees including office, clerical, superivisory, mining and production
[2]estimate from Nova Scotia Department of Mines and Energy sources
[3]processed or manufactured value